DOMESTIC ENGINEERING

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Start a Salt Lake City Club

You know, of course, that the next national convention of master plumbers will be held at Salt Lake City in 1912, probably at the end of June or early in July.

The National Association of Master Plumbers of the United States is the most important organization in the world to you if you are engaged in the plumbing business or identified with it in any way.

If you are a member of that association you ought to know it. It is not sufficient to merely give assent to the statement.

If you are not yet a member, you can be one now and celebrate your new responsibilities in Salt Lake City.

The national convention at Galveston, Tex., aroused the whole South. It has had the result of strengthening weak locals and creating new ones. It has given renewed energy to those who have fought for associational sanitary matters for years against discouraging odds.

What the Galveston convention did for the South the Salt Lake City convention is going to do for the entire West. As a result of that meeting the parent organization of master plumbers will be intensified in its national importance. Every local and state association, every individual master plumber, should be vitally interested in making the Salt Lake City gathering the greatest yet held.

To do this team-work is necessary. It is not sufficient to say, "Plenty of time yet. If business is good and cash is plentiful, I expect to be there." Nor need you wait till you receive a personal invitation from President Eynon. Anticipate your usual assortment of New-Year resolutions and make one in the early fall by way of variety. Here it is:

"I will attend the Salt Lake City convention."

A pleasing addition would be, **"and take the family along."** If you are not yet married, Salt Lake will furnish the material.

If you attend national conventions regularly, you know their immense benefit. They add to knowledge, exchange experiences, restore confidence, inspire enthusiasm, invest the trade with dignity and equip the individual with a new store of energy for his life-work.

In such case, you know it to be to your interest to get a good representation of your local members at the Salt Lake national convention. As little should be left to chance as possible. A good plan to foster strength of attendance is to form a Salt Lake City club at once. For instance, the railroad fare to Salt Lake from Chicago and return at summer rate is usually $43; sleeper both ways, $17; meals on train, both ways, estimated at $18; hotel bill in Salt Lake, estimated at $25, which includes meals; pocket-money (if you don't play poker), $25. This totals up to $128.

You must remember, however, that when at Salt Lake you are close at hand to one of the greatest glories of the United States—the Yellowstone National Park. Many of those attending may desire ot avail themselves of this opportunity—perhaps the only one in their lives—to revel in the wonders of the geyserland. A round-trip ticket from Chicago, with stop-over at Salt Lake, to Yellowstone, can be secured at summer rates for about $90. This includes hotels and stage-coaches in Yellowstone, and adds $47 to our previous estimate, bringing the total to $175.

Now, there lie before us at least 36 weeks of opportunity in the money-saving line. At $5 a week, which should be easy, we have $180 by the third week in June, amply covering the convention and the Yellowstone trip. Of course, it won't do any harm to add $50 at the last moment, for we menfolks hate to be short of cash, but there you have the proposition succinctly presented.

If the wife is going (and she should), you can double up and put aside $10. There's no one connected with your business who is better entitled to the trip than your side-partner. It will save doctor's bills and give you back the enthusiastic maiden whose hand you won (how many years ago?). Most decidedly, start a Salt Lake City club. Start it now. We will be glad if you present this editorial at your next local meeting and advise us as soon as the club is formed.

Sewer Gas and Disease*

A Popular Belief Definitely Shown to Be Baseless—Sewer Air Not So Filled With Germs of Disease as the Air of the Street

By Hollis Godfrey, Author of "The Health of the City."

(Concluded from Page 142, August 5th' 1911, Issue.)

A Little Plumbing Primer.

Plumbing is terra incognita to so many of us that a word about the means employed to remove wastes from the household may not be amiss. In his "Municipal Engineering and Sanitation," Baker writes that the essentials of sanitary plumbing are simplicity, durability, accessibility and air-tightness. To these requirements, Harrington, in his "Practical Hygiene," added thorough ventilation and plentiful water supply. Open plumbing, by its simplification of repair and construction, has done much to accomplish those ideals. The necessity for sound materials has brought about a general use of cast-iron instead of lead for soil-pipes, a notable change for the better, as iron is lighter, stiffer and more durable. Its stiffness prevents the sagging and pocketing possible with lead. The soil-pipe furnishes the means of exit to the wastes. With it, as with all the removal apparatus, a first essential is such construction that there shall be no possibility of leakage for solid, liquid or gas. The soil-pipe, however, does nothing more than provide a road for removal. Protection against the returns of sewage or the influx of sewer-gases is centred in the trap and the vent.

A trap is a device for providing a water-seal to the plumbing of a house by causing some of the passing liquid to lodge in a pocket or depression. It may be manufactured in many forms and shapes, but the simplest one of all is the running trap shaped like a U. The wastes enter this trap at A and leave at B. No matter how much water passes through, C should be left filled with liquid. This liquid seal prevents the passage of air from the sewer to the house. A vent or air-pipe V, leading to the outer air, the round iron-pipe which you may see rising through the roof of your neighbor's house, is placed on one side of the trap to provide ventilation for any gases which, accumulating in the pipes, might force sewage back into the bowl. It is also believed that the vent does away with any possible siphoning or emptying of traps because of the sudden rush of water through them.

In actual practice there are three possibilities of sewage or sewer-gases rising into a house through a trap. The level of water in the U of the pipe may fall so low as to leave the trap only partially sealed. The liquid, through some flaw, might disappear altogether. Gases generated on the sewer side might exert sufficient pressure on the liquid in the water-seal to force their way through to the soil-pipe. It is possible, moreover, though hardly probable, that germs might rise from the wetted interior surface of a soil-pipe. We have already seen that bacteria have a perceptible weight and tend to settle rather than to rise. Even with an open trap the only possibility of getting them into the house would be when they were borne on a strong air-current.

It is interesting to note how closely the principle that researches which concern the public health should reproduce natural conditions was followed in the investigation authorized by the master plumbers. Stock plumbing materials of the same sort that would be put into your house were used. A 4-in. cast-iron soil-pipe, 15 ft. long, was connected at the bottom with an ordinary running-trap. Currents of air, varying in velocity from 490 ft. to 790 ft. a minute, were driven through trap and pipe. No normal conditions would ever see an air-current of even 500 ft. a minute passing through a trap. The air in the soil-pipe was examined at different levels with the trap dried and wetted. Under no circumstances were any large number of bacteria found in the air. Only when the air-current was rushing through at its higher velocities were any bacteria dislodged at all. The conclusions of Professor Winslow follow:

Prof. Winslow's Conclusions.

"On the whole, it appears that germs are carried into the air of a house drainage system from its traps or wetted surfaces only by suction corresponding to an air current of 600 ft. per minute. It is scarcely conceivable that such a force could be exerted under any practical conditions. The friction in a 4-in. pipe is so great that a fairly hot fire inside it could hardly produce such a draft as this, and wind blowing across the top of such a pipe and directly into its fresh-air inlet at the bottom

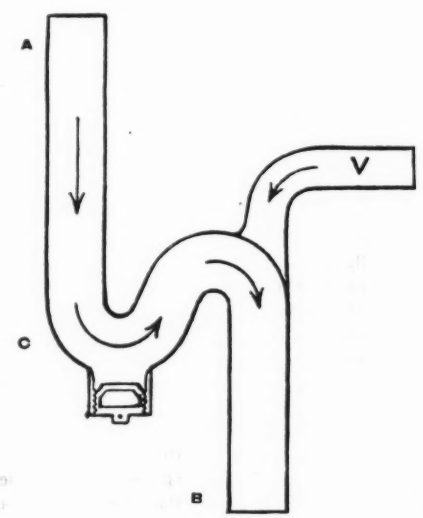


Fig. 1.

could only cause so strong an up-current under exceptional conditions. It seems, therefore, that the carriage of disease germs from the air of a house-drainage system is an improbable contingency."

In the same year (1907) that the investigation just mentioned was completed, Major W. H. Horrocks of the Royal Medical Corps reported to the Royal Society the results of a series of experiments made at the fortress of Gibraltar, especially at the Military Hospital.

The results obtained by Major Horrocks, followed by the confirming report of Dr. Andrews, startled the world of sanitarians. Making a frothing soap-solution, strongly infected with a test bacterium, the Bacillus Prodigiosus, Horrocks investigated the air in drains, in pipes and in various parts of sewers by placing open dishes containing

*From "Boston Evening Transcript."

sterile nutrients at points above the infected solution. These dishes, one and all, showed the characteristic red colonies of Bacillus Prodigiosus. Experiments made with the typhoid bacillus under similar conditions showed cultures of this organism.

A British Expert Differs Radically.

Major Horrocks' principle deduction from these experiments was stated as follows: "Specific bacteria present in sewage may be ejected into the air of ventilation-pipes, inspection-chambers, drains and sewers by (a) the bursting of bubbles at the surface of the sewage, (b) the separation of dried particles from walls of pipes, chambers and sewers, and probably by (c) the ejection of minute droplets from flowing sewage."

Results so contrary to the previous work accomplished naturally provoked much criticism. On their publication the Sanitary Committee of the Master Plumbers' Association took up the problem anew and commissioned Professor Winslow to carry on a second series of experiments to check the results obtained by Horrocks and to carry them further if possible. This was especially necessary, as the Horrocks experiments had been made in a somewhat different fashion than had hitherto been attempted. Soapy water was used. The method of leaving plates containing nutrients freely exposed to the air for consideraable periods of time, commonly for 24 hours, left great possibilities of contamination. Such contamination might proceed not only from a worker lowering the plates to place, but also from the more probable cause of infection of dust and flies. Almost all the Horrocks tests were qualitative, not quantitative. The plates examined were simply exposed for various periods of time to unmeasured volumes of air.

Checking the Briton.

The isolated fact that harmful bacteria are found in any place is not necessarily a sign of danger. They are so plentiful that we can scarcely escape them and their growth is so rapid as to be almost beyond our comprehension. These micro-organisms grow by division and some of the species grow so rapidly as to divide twice every hour. One at the beginning of an hour means four at the end if all survive. The rapidity of this type of multiplication is extraordinary. In a day, if nothing stopped the growth, Professor Conn has figured that one bacterium would have 16,500,000 offspring, so to speak. Two days would produce 281,500,000,000, which would form a solid pint of bacteria weighing about a pound. Three days, still assuming that nothing stepped in the way of their growth, would produce 47,000,000,000 billions, which weigh about 16,000,000 lb. These figures are of course wholly theoretical for the simple reason that something always does step in the way. Before the descendants of the bacteria reached even to the millions, lack of food, over-crowding and the accumulation of their own life-processes would stop further growth. But the essential point remains—that bacteria multiply with a swiftness beyond our ken. A thimbleful of milk may contain hundreds of thousands of these organisms. Its content may easily reach to the millions. The milk is unusually pure if it contains less than 10,000 in this slight volume. A quart of infected water may easily contain millions of harmful organisms. It is next to impossible to shut them absolutely out.

New York City Water Full of Bacteria.

New York city water, a surface water of good quality, will almost always contain 100 bacteria of the sewage-type to a quart of water. Such a bacterial content indicates a slight degree of pollution which would be better done away with, yet New York water is drunk without serious harm by hundreds of thousands. A quart of water is a small amount for use during a day. If we breathe in no more harmful germs than that amount contains we shall probably suffer no injury from specific infection from the germs of sewer-gas.

The Horrocks experiments showed some indicator germs. It is the belief of experimenters that the appearance of a few indicator germs like Bacillus Coli, means a small chance of getting any disease germs. There is, of course, a chance, yet at best the human race must take some chances. By comparison with the grave dangers offered by infected milk and water, the danger from sewer-gas is indeed slight.

The second part of Winslow's work on this subject was devoted to a careful imitation of the Horrocks methods and a still more extended examination of the air in plumbing systems actually in use in residences, hospitals, offices and hotels. The report of the Sanitary Committee of the Master Plumbers for 1909 gives the full story of this search for the truth. It contains the answer to our original comparison of equal quantities of street-air and sewer-air. It involves three of the most interesting applications of the possibility of joining actual conditions to laboratory methods that have been yet recorded.

What Excursion into Boston Sewers Reveals.

Entering the Boston sewer in a boat chamber, the investigators placed dishes containing sterile nutrients beside the eddying stream of sewage and on various steps leading to the street. The colon bacillus, characteristic of animal wastes, was found on every plate, but the numbers of these bacilli were least nearest the sewer, greatest nearest the street, and the increase from sewer to street was constant. Remember the point made earlier, that these organisms, tiny as they are, have a perceptible weight and settle swiftly, and you will see that these results indicate one thing—that the bacteria found in sewer-air come chiefly from street-dust infected by such agencies as manure, not from the sewer.

A soapy solution, like that used in the Horrocks experiments, was next tried. Qualitatively, without reference to numbers, it appeared that bacteria (Bacillus Prodigiosus) appeared in air above foaming liquids containing over 15,000,000,000 of this specific organism. Dilution such as this can harm no one. Winslow carried the matter still farther. Setting up an ordinary water-closet and reproducing the natural splashing of water passing through it, he examined 44 samples of air to see if infection could take place under these conditions. One case of contamination, and only one, occurred. One plate, and only one, was apparently infected by a single drop. Again quantitative methods showed clearly that the possibility of disease from the germs of an ordinary house-system were too slight to be considered. The investigation of 19 plumbing systems in actual use showed the general air of house-drainage systems to be amazingly free from sewage organisms, far freer in fact than the air of the street or the common water-supply of many cities.

According to this investigation, therefore, a man in an ordinary room would have to breathe undiluted sewer-air for 24 hours on a stretch if he were to take into the system as many sewage bacteria a pint of New York water contains. Only at these points where sewage splashes into spray does the bacterial content increase above this ratio and then only for a few moments. Suppose we sum the matter up with the closing sentence of Professor Winslow's report: "I believe, however, that my results, in the light of all previous evidence, warrant the conclusion that the chance of direct bacterial infection through the air of drains and sewers is so slight as to be practically negligible."

The results obtained by Horrocks failed in two respects. His use of heavily infected, foaming emulsions to represent sewage did not actually represent the conditions which exist in a common house drain-pipe or in the sewer. His reliance

on qualitative measures did not give sufficient information as to actual every-day conditions. Bacterial life is so widespread, so nearly omnipresent, that the mere presence of various organisms in air is not enough to condemn the air. It is possible to pass bacteria from sewer to air under exceptional conditions. It is very improbable such passage can cause disease.

In the preceding portion of this article I have considered the grounds on which sanitarians base their disbelief of the common theory of the carriage of infectious disease by germs in sewer-air. There remains, however, a second possibility which receives but comparatively little consideration. One chance of deleterious action on the part of sewer-gas remains which has not been solved—the general predisposition to disease which may be caused by the constant inhalation of odors from sewage or of such gases as ammonium sulphide, carbon monoxide and hydrogen sulphide, all of which possess poisonous properties and all of which may be generated during the decomposition of organic matter. Records are in existence which tell of the deaths caused by accumulation of heavy gases in cesspools and in dead ends of sewers. Such deaths, however, are due to suffocation or to poisoning with such gases as hydrogen sulphide or illuminating gas, not to the deadly germ enemies commonly supposed to inhabit sewers. They are few in number, and the testimony of vital statistics shows that sewer-workers are unusually strong, with a high mean age at death and a low death rate.

Vital resistance, the varying powers of different persons to resist disease, is no slight factor in the total forces ranged against the attack of sickness. It is entirely possible that the odors of sewer-gas, interfering with appetite and digestion, might weaken the general condition. There have been no investigations, so far as the writer knows, into the problem of predisposition to disease resulting from exposure to sewage, excepting for the research conducted some years ago by Dr. Alessi of the University of Rome. Alessi concluded that exposure to sewer-air did diminish vital resistance. Notable as those results were, their lack of confirmation and their comparatively limited extent requires caution before they can be accepted as wholly authoritative.

Roechling, the author of the important work, "Sewer-Gas and Its Influence on Health," believes that the action of sewer-gas may predispose the individual to the attacks of disease, and no small number, especially of British sanitarians, as has been said, agree with him. It is an interesting commentary on the other side of the question, that of six American books on the causation of disease, taken at random from the shelf, the indices of one-half show no reference to odors or to sewer-gas.

A Horrible Stench but No Gain of Disease.

A quotation from Dr. William Budd, given in Sedgwick's "Sanitary Science and Public Health," is so peculiarly pertinent to the matter in hand that a part of it will bear repetition here:

"The need of some radical modification in the view commonly taken of the relation which subsists between typhoid fever and sewage was placed in a very striking light by the state of the public health in London during the hot months of 1858 and 1859 when the Thames stank so badly.

"An extreme case, a gigantic scale in the phenomena, and perfect accuracy in the registration of the results—three of the best of all the garantees against fallacy—were combined to make the induction sure. For the first time in the history of man, the sewage of nearly 3,000,000 of people had been brought to seethe and ferment under a burning sun, in one vast cloaca lying in their midst.

"The result we all know. Stench so foul, we may well believe had never before ascended to pollute this lower air. Never before, at least, had a stink risen to the height of an historic event. Even ancient fable failed to furnish figures adequate to convey a conception of its vile Augean foulness. For many weeks the atmosphere of Parliamentary committee-rooms was only rendered barely tolerable by the suspension before every window of blinds saturated with chloride of lime, and by the lavish use of this and other disinfectants.

"Members of Parliament and noble lords, dabblers in sanitary science, vied with professional sanitarians in predicting pestilence. Meanwhile, the hot weather passed, the returns of sickness and mortality were made up and, strange to relate, the result showed, not only a death-rate below the average, but, as the leading peculiarity of the season, a remarkable diminution in the prevalence of fever, diarrhœa, and the other forms of disease commonly ascribed to putrid emanations.

"After describing in scientific and forcible terms the unprecedented state of the river, Dr. Lethby adds: 'With all this condition of the Thames, however, the health of the metropolis has been remarkably good.'"

Plumbing Regulations Needed.

One near-by possibility of infection from the bathroom has been too much neglected in the consideration of the comparatively remote possibility of more distant germ-infection—the spilling of slops poured down the hopper by careless servants. That this provides no small number of bacteria to be borne by flies, hands or other agencies through the house, few can doubt who investigate the subject carefully. Fortunately the cure is directly in the housekeeper's hands. Here, as in so many other places, the woman in the home can do more than man in the seat of government to better affairs through cleanliness. There is every probability that unclean, ill-ventilated house-plumbing will give off stronger, more immediate and more persistent odors than any sewer. Odors from bath-tubs and set-bowls, for example, are commonly due to decomposing soap in the overflow pipe.

An analysis made some years ago of the status of the plumbing laws indicated a wide divergence of requirements made by states and municipalities. At that time only 19 states, the District of Columbia and Porto Rico had laws with regard to plumbing, but the large cities of most of the states had laid down individual regulations. Most of these ordinances require master plumbers to have licenses. About a third require master plumbers to furnish bonds ranging in amount from $200 to $5,000. The majority require extra heavy cast-iron soil-pipes, running-traps and fresh-air inlets. Vent-pipes in general must be of cast-iron or of galvanized wrought-iron, and must extend from one to three feet above the roof.

Plumbing regulations, like many other ordinances intended for the city's health, are cursed with certain typical evils. They are indefinite, stating, for example, that certain parts of the plumbing shall be "Suitable," "Adequate," "Properly installed." They are by no means uniform. They are stated in too complex a fashion and they vary from the extremes of excessive caution to excessive laxness. They are not firmly based on the broad foundation of the body of scientific fact already acquired. The Sanitary Committee of the Master Plumbers' Association, which has done so much good work, has embodied a recommendation on this point which deserves quoting entire.

"A law, to be broad enough to be workable throughout the length and breadth of the land, must be simple and short, and must not enter into the intricacies of the so-called "Science of Plumbing"; must have few requirements of an administrative nature, and should look wholly towards the making responsible of the master plumber, as a merchant

mechanic towards his fellow citizens, and should go no farther.

"Boards of health should supervise proper health protection in plumbing as in all other health requirements."

The case of the people vs. sewer-gas, as originally entered, contains two charges, a major and a minor. On the evidence submitted I believe we may fairly acquit the defendant on the major charge and declare that sewer-gas cannot produce infectious disease through rising germs. On the minor charge, that exposure to the gases of the sewer may produce predisposition to disease, the evidence submitted is still inconclusive. We can scarcely do more than register the Scotch verdict of "Not proven."

The results so far obtained show us one truth at least of no slight importance. Where infectious disease exists we must look elsewhere than the sewer for its causation. That fact renders it no less our duty to ensure proper sewers and a proper disposal of wastes. It merely shifts our attack to the proper quarter. Instead of striking at a point where the enemy has made a feint, we should attack his main force at those weak points of his chain of defences which our scouts have laid bare.

The change of the scientific attitude with regard to sewage is one of the interesting developments of reversal brought about by an increase of knowledge. Where sanitarians formerly believed that sewer-gas, if not the root of all evils, was certainly the root of many of them, sanitarians today consider sewer-gas as a comparatively harmless substance, but pay the greatest attention to liquid-sewage as a means of infection. To laymen, on the other hand, the noxious qualities of liquid-sewage are but little considered. Filled with infectious disease, it requires the greatest care in its handling and disposal. Even though streams of sewage, emitting evil odors and offensive to the senses, cannot directly produce disease, yet it is most essential that they should be safely, accurately and thoroughly disposed of. It is only the barbarian who does not remove sewage from the sight and smell of his community.

To the plumbing craft, who gave time and money to clear the mists that overhung the sewer, and who, in so doing, gained a scientific foundation for their labors, honor is due. The possibility of a generous emulation in different fields stands open to many another craft and trade. Where one has led the way let others follow.

PLUMBING INSPECTORS PLEASE NOTE THIS!

Otto Schadde, a master plumber, of Baraboo, Wis., was in Chicago last week, visiting the trade. Mr. Schadde is preparing a plumbing ordinance for his city and he would like to receive copies of plumbing ordinances of cities having a population of about 10,000. "Domestic Engineering" gave him several ordinances, but he would like to get all he can. Plumbing inspectors are requested to come to his assistance.

HE BELIEVES IN HIS OWN WORK.

J. Oscar Smith, Moberly, Mo., has recently secured the contract for the installation of a Moline vacuum-vapor heating-system in the Virginia building, Columbia, Mo. This building consists of six store-rooms and is two stories high, the basement also being heated. The contract-price is $4,000. Mr. Smith is a contractor for steam and hot-water heating, installs Leader water systems for country homes, and acetylene lighting systems. On his letter-head he has: "Old houses heated as easily as new ones, with healthful heat with no repairs." There is nothing so good as believing in the work one does.

Watertown, Wis.—Bids for installing a heating plant in the police station have been asked.

PACIFIC COAST COMMENTS.

San Francisco.

The August building record showed a slight falling off compared with the average for the past seven months, but the figures are still regarded as being high and are sufficiently large to place this city far in the lead of Coast cities in this line. A lively political campaign of local character is now being waged here and there is no doubt but that this is having the effect of retarding work in the building line. In fact, plans for several very large structures have been held up pending the outcome of the elections, and builders generally are of the opinion that this election means more to San Francisco than any other ever held here. Political ties are being cast aside and a struggle is now on between the forces of good government and decency and the regime that has had control for several years and has built up a powerful machine. James Rolph, an admirable business man of high ideals and of much executive ability, is opposing Mayor McCarthy and has the support of the better classes. In touching upon the political campaign and its effects on building, a prominent manufacturers' representative in the plumbing goods line recently stated that to his personal knowledge there were twelve prominent eastern capitalists with millions to invest now staying at the Palace Hotel watching local developments. One of these men made the remark that if the present mayor was returned to office not one dollar would be put into a business enterprise here. These easterners were attracted here by the great possibilities for investment that will come as a result of the opening of the Panama Canal and the holding of the Panama-Pacific International Exposition. However, they do not care to risk their money in a city where municipal affairs are in such a shape as they are here. The master plumbers' association as a body is taking no part in the campaign, following its principles of fair play, but many of the individual members are and their support of Rolph is almost unanimous.

The Masonic Temple Association of California is planning to erect a magnificent six-story steel frame and concrete building at Van Ness avenue and Oak street, not far from the headquarters of the San Francisco Master Plumbers' Association, and contracts are now being let for the work. Some of the contracts already let show comparatively high figures and indicate that the work done is to be of an unusual character. William S. Snook & Son have been awarded the contract for the installation of the plumbing work, this being valued at $11,244. The Pacific Fire Extinguisher Co. has secured the heating and ventilating contract, the consideration in this instance being $26,682.

The buildings at Ingleside which have been occupied for some time by the city have been vacated, owing to the completion of the city hospital on the almshouse tract, and the equipment of these has just been sold. Considerable comment has been aroused by the fact that the material sold, which cost several thousand dollars, was disposed of for the paltry sum of $91. Included in the material were 70 sinks in good condition, together with considerable plumbing material, two heaters and a costly range.

Contracts have been let for the plumbing, heating and ventilating work in the four-story class-A store and office-building being erected on Market street, near Kearny, by the Bankers' Investment Co. The plumbing work will be done by Wm. C. Snook & Son and the heating and ventilating work by John G. Sutton & Co.

Lettich Bros. have been awarded the contract for the installation of the plumbing, gas-fitting and sewering in the four-story building being erected at Spring and Summer streets by the Doyle Estate Co. The consideration mentioned is $2,075.

M. S. Burrows, secretary and treasurer of the American Steel Pipe & Tank Co., of Los Angeles, has recently been in San Francisco on a short business trip.

Public health is the foundation on which rests the happiness of the people and the power of the state,—that is why I consider the first duty of a statesman is the care of public health.—Benjamin Disraeli.

A CENTRAL-HEATING PROBLEM.

Editor "Domestic Engineering":—A man has a satisfactory hot-water job of about 700 ft. radiation, but he wishes to heat his house from a central heating-plant. The pressure is from 2 lb. to 3 lb. Would he be able to heat it by means of a coil in tank, similar to domestic hot-water supply? If so, how would you figure out size of coil and tank? Would it be economical? Also, is it part of the regular practice to use a check-valve on city water supply to boiler on high-pressure heating? Is an injector also supposed to be fitted, in case of accident to pump?

Thanking you for the many helps I have received from your journal, I remain.

N. Dak. "A Helper."

So much depends on the layout of the system already installed, the arrangement of coil and heater, the rapidity of circulation attained and the consequent heat transfer from the coil, that it is difficult to estimate the exact amount of coil surface required.

With 700 sq. ft. of direct hot-water radiation, and central station steam at 2 or 3 lb. pressure as our known factors, we will assume the water 170 deg. entering and 140 deg. leaving the radiators, 70 deg. room temperature, and an average steam temperature in the coil of 215 deg. This gives an average temperature in the radiator of 155 deg., or a difference of 85 deg. from the room temperature. Taking an average value of 1.8 B. t. u. transmitted per sq. ft. per hour per degree difference in temperature, we have

$$700 \times 1.8 \times 85 = 107{,}100 \text{ B. t. u.}$$

transmitted per hour to the air. Adding 25 per cent for uncovered pipe, etc., gives approximately 134,000 B. t. u. required per hour.

The difficult question to answer is, how many B. t. u. we can expect to transmit from the steam to the water per sq. ft. per hour per degree difference in temperature from the surface of the coil. Assuming this factor as R = 50, and 60 deg. difference in temperature, gives the sq. ft. of coil surface required as

$$\frac{134{,}000}{50 \times 60} = 44\ 2/3 \text{ sq. ft.}$$

If, due to more rapid circulation or a particularly advantageous arrangement of the coil, R could be increased to 100, the sq. ft. of coil required would be half the amount just estimated.

With a fall of 30 deg. in the water in the radiator, each pound of water gives up 30 B. t. u., or 250 B. t. u. per gallon. $134{,}000 \div 250 = 544$ gal. per hour to be circulated through the system in order to maintain the temperature of the air at 70 deg. According to common practice, this system probably has a total volume of about 300 gal. of water, giving a circulation in the above case of twice an hour. It is customary in hot-water heating, where the circulating water is heated with exhaust or low-pressure steam, to allow one lb. of steam to 4 sq. ft. of radiation. On this basis this job would require 175 lb. of steam per hour.

The most advisable thing to do in a case like this would be to install a regular heater of proper size and design. The cost would be less than that of a home-made affair, and good results much more certain. Or, if the customer were willing to heat with steam instead of hot-water, the change to central-station steam could be made without great difficulty or expense.

In regard to using a check-valve in the boiler feed-line from the city main, it is good practice always to use a check-valve in the feed-line, no matter what the source of supply. As to whether to add an injector to a plant already having a boiler feed pump, it would be considered a wise precaution, and then use the injector instead of the pump, keeping the latter as a piece of emergency apparatus to be used in case the injector laid down. The injector is the most efficient and the ordinary boiler feed pump the most wasteful method of feeding a boiler.

WHAT DOES "HORSE-POWER" SIGNIFY?

Editor "Domestic Engineering":—Will you kindly confer a favor on us by answering the following question? In using the word or term "Horse-power," as 10-h.p. or 50-h.p., what number of pounds does a "Horse-power" signify?

C. P. & H. Co.

To exert sustained pressure through space is WORK.

One-pound pressure exerted through one foot of space is a UNIT OF WORK.

If we lift 33,000 lb. to the height of one foot in a minute, we will have used a horse-power. In other words, horse-power is the rate of work.

A 10-h.p. engine, then, is capable of raising 330,000 lb. to the height of one foot in one minute. It is otherwise put, for brevity's sake, as 330,000 foot-pounds. About 2 lb. of fuel are required per h.p. per hour.

If this information is not as complete as you desire, write to us again.

AN OLD-TIME CEMENT.

Editor "Domestic Engineering":—Many years ago, when some of the sectional cast-iron boilers came in such shape that some of the parts had to be made up and cemented on the job, we used to make a cement of white and red lead and some other things that was a fine cement. I wonder if your practical man can give me this recipe? Trusting to see it in the paper, I remain,

St. Louis. "Old Timer."

He sure can, for he used to have to put his "mitts" in the mud every time. It was made something as follows: You took a certain amount of white lead, quantity being governed by the job at hand, and upon the white lead you dusted the red lead. Now as you "wummoxed" this mass around, there was some very fine iron filings, or better still, iron dust if you could get it, handy and this dust was also sifted upon the mixture. Some oil was necessary and it was boiled oil that was used. It took some time to work the mass up to just the right consistency and not much more than was wanted was made, for it did not keep, but hardened quickly. With this cement I have made joints that have held some heavy pressures and stood up to the test for years. I believe that there are boilers

now working that were put together with this cement over 30 years ago and the same boilers are still in the ring and doing mighty good business. I never wrote down the exact proportions, but have given the process and the ingredients as we used to make them up, and could mix up a batch of the same today if the occasion called for it.

HOW TO MEASURE 45-DEG. ELLS.

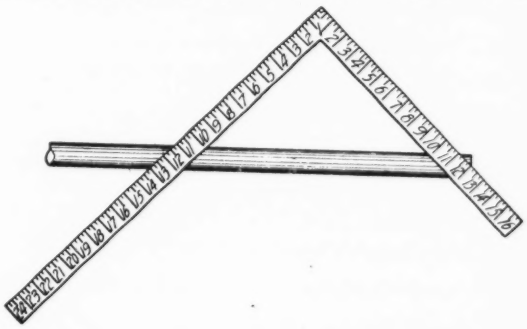
Editor "Domestic Engineering":—I wish you would explain the easiest and best way to measure 45-deg. ells.

Springfield, Ill. J. L. Madden.

We know of no better rule than the following, submitted by John Troland, Norwich, Conn., which we take pleasure in republishing from "Domestic Engineering" of October 9, 1909:

In the diagram shown herewith the desired effect is twelve inches, but any other length, even including fractions of an inch, can be obtained.

Rule—Lay the common steel-square on the pipe to be cut, touching the two points 12—12, and you have the



How to Measure 45-deg. Ells. Sketch by John Troland.

accurate length from center to center. Mark off allowance for the ells and cut at that mark.

If the offset required be of a length beyond the span of the square, say 25 inches, mark once from the numbers 12 to 12, and then 13 to 13, or take the numbers 15 to 15 and then 10 to 10, or two times 12½ to 12½ and you have it. The result will be the same.

Besides being easy and quick, this rule has the virtue of being mathematically correct.

HOW TO TEST WIPING SOLDER.

Editor "Domestic Engineering":—I have tried several times to find the right information in regard to the wiping solder and if you have it handy I wish that you would publish it, for I am not able to find the article. Please run it in the next paper if you can.

"Solder."

The practice generally followed is to use two parts tin and three parts lead. If the material used is all right, the result produced may be satisfactory and then again it may not. We have tried it ourselves many times and arrived at the conclusion that, while the proportions given may be correct, they are only a base from which to act to get the solder to suit your hand and fancy. In testing the solder, stir it up quite well and then pour several droppings on some brick or boards and observe the appearance when it cools. If it has a spotted look, it will probably be all right. If it is unusually bright, it has too much tin. If it is quite dark, it has too much lead. The more tin the finer, and the more lead the coarser. You can experiment and get the solder regulated to suit your needs from these directions.

MANUFACTURERS OF HAND-BELLOWS.

Editor "Domestic Engineering":—Answering A. C.'s question in the August 26th issue, I advise that the best maker of hand-bellows is S. Obermayer & Co., Cincinnati, O.

New York. F. G. McC.

Editor "Domestic Engineering":—"Who makes small bellows?" Any electrical supply-house lists these in their general catalog, they being used chiefly in cleaning about motors, dynamos, etc. I. B.

MANNER OF HOLDING BRASS PIPE.

Editor "Domestic Engineering":—Will you tell me if there is any special kind of vise made for holding brass pipe? If not, how can you make a good job of it in an ordinary vise? I have tried winding a cloth or paper around the pipe, but the idea was not a great success.

St. Louis. J. H. G.

There is a special kind of vise made, built on the lines of the wrenches made for use on brass pipe, the grip being secured through means of a strip of ducking which has been well rosined. We have seen some plumbers split an ordinary pipe coupling lengthwise and fit the inside with some lead pipe. The idea seemed to work well and the pipe was held firmly and without denting or scratching. In other cases we have seen blocks of wood used. To do this, secure a solid block of wood that will fit in the vise to advantage. Then bore a hole of the right size through the block. Split the block and plane down the inner faces so that they will not meet when the pipe is in the block. This gives a tool that will hold the pipe to good advantage and can be easily and quickly made.

RULE FOR READING TEES AND ELLS.

Editor "Domestic Engineering": There is a definite and positive rule for reading fittings. Ells are always read the longer end first, where one opening is larger than the other. For instance, 1x½ ell, or 2x1¼ ell. Tees are always read the one way, whether they are inserted upside down or downside up, left-handed or sideways. Always read the run and the largest opening on the run first, then the branch. For instance, ½x⅜x¾ tee; ¾x½x⅜ tee; ⅜x⅜x1 tee.

Newark, N. J. H. F. Baillet.

Sadly Mistaken.

"Dubson is rather inconsistent."

"Why do you think so?"

"Just because he happens to be a stick he thinks he's presidential timber."—Birmingham Age-Herald.

Nice Girl.

Dick—There's one thing about Louise, she never repeats stories about her women friends.

Ethel—Repeats! No, indeed! she starts them.—Boston Transcript.

Waynesburg, Pa.—B. C. Clark, plumbing and heating in $8,000 residence for A. A. Purman.

The Boss Talks to His New Foreman About Heating

Written by T. Twice

IV.

Well, we might as well take up the matter of pipe sizes, John, and the following tables will cover this in good shape, and be handy in laying out your jobs. It will be very seldom that you will be called on to run a smaller main than 1½-in., John, and we will start with this size and show the extreme amounts of radiation you can safely carry on the various sizes from 1½-in. to 6-in. pipe, with an average total length of your circuit of 100 ft., and velocities of 30, 40, 50, 60, 70 and 80 ft. per second.

You will find the 30-ft. per second velocity a safe one to use, and you can assume a pressure drop of 1 oz. "Total length of circuit" means the distance from where the main leaves the boiler until it drops into the return opening of the boiler, and not the distance from the boiler to your last radiator. The 30-ft. velocity applies to one-pipe gravity-work; for two-pipe work, you can safely use the 60-ft. velocity.

Schedule of Steam-Mains—2-lb. Gage Pressure.

Size pipe in ins.	30-ft. Velocity	40-ft. Velocity	50-ft. Velocity	60-ft. Velocity	70-ft. Velocity	80-ft. Velocity
1½	160	200	250	300	360	410
2	320	400	490	605	710	805
2½	475	590	730	905	1060	1210
3	685	875	1040	1310	1535	1710
3½	940	1230	1470	1840	2145	2400
4	1250	1590	1935	2440	2800	3180
4½	1560	2040	2430	3030	3525	4080
5	1930	2500	3125	3750	4370	5025
6	2700	3590	4500	5400	6300	7200

You will find the 30-ft. velocity a safe one to use for ordinary work, but where you strike a low cellar, where you cannot get much difference between the water-line in the boiler and the end of your main where it drops into the return-opening in the boiler, you may have to drop to the 20-ft. velocity. For two-pipe gravity work, vacuum or vapor heating, the 60-ft. velocity will give good results. We will take up the various vapor systems farther along, John, and see what we can make out of them. They are all "good" (?), but what we want to know is, which one is the best for us to handle.

As a rough guide for proportioning your steam-mains, John, you might use the following velocities:

Sq. ft. Radiation.	Velocity.	Sq. ft. Radiation.	Velocity.
100 to 400	30 ft.	1200 to 2800	50 ft.
400 to 600	30 ft.	2800 to 4200	50 ft.
800 to 1200	40 ft.	4200 to 7000	60 ft.

The safe amounts and velocities on both steam-mains and branches, you will have to learn by experience, as conditions on the job will largely govern these amounts, but you can use the above as a basis for laying out your work, and feel reasonably safe. You might work out a very elaborate set of tables for sizes of mains and branches, John, but it requires the practical experience to boil them down to a safe working basis. Make a practice of going back to your jobs three or four times after you have turned them over to your customer, John, and note the operation of same and see if you can find anything that could be improved on in your next job. You will be surprised at the bunch of information you will pick up in doing this, and your customer will appreciate the interest you are taking in his work. This will create a good impression, and, at the same time, you are educating yourself. Education will not come to you, John; you have to go after it with a stick of dynamite sometimes. Some fellows never go near a job after they have finished it, rather giving it the appearance of having "handed" their customer something. Nothing to that policy, so don't start it. The customer might have another job for you before he dies, and will remember the interest you took in his previous job. Some food for thought there. Well, let's look into the size of branches.

Schedule of Branch Connections.

Size pipe in ins.	10-ft. Velocity	15-ft. Velocity	20-ft. Velocity	30-ft. Velocity	40-ft. Velocity	50-ft. Velocity	60-ft. Velocity
1	25	37	50	75	100	122	150
1¼	38	55	75	116	152	195	230
1½	65	85	112	170	225	270	337
2	100	150	200	298	400	495	590
2½	155	232	310	465	620	775	930
3	218	327	437	685	873	1040	1310

You will find the 20-ft. velocity for your horizontal branches from mains and the 30-ft. velocity for the vertical risers will give good results. It is always good practice to make the horizontal branches from the mains one size larger than the risers, as this will enable the water of condensation to flow freely back to the main without conflicting with the flow of steam to the radiators. Where you have a long horizontal branch, it is policy to figure on a low velocity, say 15 ft.; this will overcome the friction loss in a long, flat branch. It is good practice, however, not to have your branches over 3 ft. long, and REAM your pipe ends. Here is the table I spoke about the other night. You will readily see that you are a loser when you do not ream the pipe ends.

Friction Loss in Pipe Ends By Not Reaming Same.

Size pipe in inches	Actual Inside Diameter.	Diameter of Burr.	Per cent Reduction.
1/4	23/64	1/4	30.4
3/8	1/2	3/8	25
1/2	41/64	33/64	19.5
3/4	27/32	45/64	16.6
1	1 3/64	59/64	12
1 1/4	1 25/64	1 9/32	8
1 1/2	1 39/64	1 31/64	7.7
2	2 1/16	1 61/64	3.1

Perhaps you never gave this any thought, John, but it is worth thinking over. Well, let's "beat it," and we will have another "seance" tomorrow night.

(To be continued.)

PUBLIC-COMFORT STATIONS PROPOSED FOR TOPEKA, KANS.

It has been proposed that the city of Topeka, Kans., build a comfort-station under the sidewalk on Kansas avenue between Tenth avenue and Gordon street, and Mayor Billard is giving careful consideration to the suggestion, which is made by more than 200 petitioners led by Carl P. Bolmar.

WISCONSIN NEWS.

De Pere.—The State Board of Control has awarded contracts for the new heating-plant at the state hospital in Mendota. The Downey Heating Co., of Milwaukee, will supply the piping for $8,774; the Washington Steam Pump Co., of Chicago, will install five pumps for $687; and the American Steam Pump Co., of Chicago, will furnish a single pump for $180.

Kenosha.—The Board of Education is receiving bids for all plumbing and sewerage required in the Frank school, now in construction. The specifications have been prepared by Architect H. Hahn, 210 Market St. The chairman of the building and grounds committee is Michael Sullivan.

De Pere.—Bids for construction and plumbing of a brick building, 14 by 44 feet, to be used for toilet and storage rooms by the St. Francis congregation, are being received by the pastor, Rev. Geo. Dillon.

Mandan, N. Dak.—Paul Heckert, who has had charge of Fred Domeyer's plumbing establishment at Carrington, N. Dak., has purchased Mr. Domeyer's business at Mandan and will take personal charge.

"SHOULD PLUMBING ORDINANCES PROHIBIT THE USE OF ALL TRAPS WITH INTERIOR CONCEALED PARTITIONS OR DEFLECTING PROVISION OR APPLIANCES?"

By H. J. Luff, Member, Cleveland, Ohio.

I was asked to prepare a paper for your consideration, in the expectation, no doubt, that it and the discussion following, would sound the death-knell of the enemy that has set at defiance our efforts to secure perfect house-drainage construction for so many years past.

It has been a matter of grave concern for a great many years on the part of practical men in our profession, that with the splendid advancement made in the design and material of plumbing fixtures and their installation, the eradication of this evil should be so difficult to accomplish. About many matters that engage our attention, such as extra-heavy versus crock pipe for house-drains, standard or extra-heavy pipe for stacks, lead or galvanized wrought-iron pipe for waste-branches, 14-gage or iron-pipe size brass tubing for exposed piping, etc., there are reasonable grounds for an honest difference of opinion, but for concealed interior partitions or deflectors in traps, except where the seal of the trap is plainly visible, there certainly should be but one verdict: prohibition, not district, city, county or state, but national.

I emphasize national action because of the fact that while many of us thought that we were making splendid headway against this evil, the treasury, war and navy departments of our national government have specified a trap of this type in their uniform specification for 1910, thus seriously retarding our efforts for the time being. This fact, together with the advertised statements of some manufacturers of this style of trap, that they were approved and adopted by the plumbing inspectors, sanitary engineers and boards of health throughout the country, led me to respond to the request of the publication committee, and endeavor to cover the subject in all its phases.

My serious attention was first called to this style of trap about 18 years ago, after being called upon to locate the offensive odors emanating from bath-rooms. Applying the smoke-test to convince my clients where the defects were, I frequently found them to be from loss of water-seal of traps of this design.

I endeavored to get the use of these traps prohibited, but could not arouse enough interest at the time to accomplish it. About this time, two Cleveland manufacturers of this style of trap endeavored to secure the passage of amendments to our code permitting the use of these traps without requiring a re-vent, claiming anti-syphonic construction. This stirred up quite a hornet's nest, and the master and journeymen plumbers co-operated, and, fortified with a letter of condemnation from Mr. Thompson, of the International Correspondence Schools, we were able to prevent the passage of the ordinance.

The fact that it was intended to dispense with the re-vent pipe was what stirred up the opposition, and if the same energy had been directed towards prohibition on the grounds of faulty construction, we might at that time have lined up with the cities whose intelligence and public spirit had already prohibited use of these traps. As it was, they were used for some ten years after that, and upon being appointed as a member of the examining board of plumbers, I immediately secured the co-operation of my colleagues and the board of health; and the inspector was authorized, under the rule that required all material to be free from defects, to prohibit their further use. When our new code was passed in 1909 it specifically stated that this style of trap was prohibited, to prevent any further argument.

I have known an architect to refuse to accept a job of roughing-in work because one of the calked joints was, as he termed it, "weeping" perhaps a tear in 24 hours; and refuse to consider exchanging traps with secret partitions which might cry their seal away in five minutes, for those without this defect, and that after his attention had been seriously called to it.

There are cities today in which the name of a specific trap of this type is incorporated in the code, where the use of an anti-syphon trap without the re-vent is permitted. I know of cities where the plumbing inspector has protested against the use of such traps, but those in authority over him have ignored his protest and continued to permit their use.

When cities in their codes require extra-heavy cast-iron house-drains, prohibit coated cast-iron pipe and fittings so as to prevent a casting with a sandhole being used, require an elaborate system of ventilating and re-vent piping, prohibit the use of slip-joints on the drain-side of traps, and require iron-pipe size brass tubing for exposed work, and then deliberately permit traps with secret partitions, it presupposes one of three conditions, viz: ignorance, indifference or graft.

I made it my business to call on one of the gentlemen in the employ of the government who was responsible for the specification of this type of trap, and the reasons assigned by him for agreeing to this specification exonerate him entirely from the intimation of indifference or graft, but I do not hesitate to say his study of the matter was entirely too superficial.

I feel that this society is entitled to know, as its interest has been aroused, the reasons assigned by this official for his acquiescence in this specification.

First: The government wanted to make provision for the use of an anti-syphon trap without re-venting under certain conditions, and selected one on which the patent had expired and so could be made by any manufacturer. This, you will readily see, eliminates any idea of graft.

Second: Manufacturers had assured him that with the specifications requiring a thickness of casting of three-thirty-seconds of an inch there need be no apprehension of sandholes in these partitions, and further that the traps would all be tested, and as the manufacturer's reputation would be at stake, the greatest care would be exercised in seeing that these traps would be perfect. Here is where I claim he placed too much confidence in the manufacturer and had he given the matter the serious consideration which it deserved, and looked carefully into the construction of that trap, he would have seen how utterly impossible it was to have detected all the defects without cutting it in cross-section.

But now to the main question, "Should Plumbing Ordinances be Passed to Prevent the Use of All Traps With Interior Partitions or Deflecting Provision or Appliances?" I would omit from the all, those where the seal of the trap is plainly visible, otherwise I would say, Yes.

For the benefit of those who may not be inclined to go that far with me, I will anticipate their reasons and subdivide these traps into their degrees of imperfection. First: Those with secret partitions in which it would be possible for the seal of the trap to leak into the waste-pipe unnoticed, or sewer-air leak over the seal of the trap. I have taken the pains frequently to test cast-brass and lead traps ready for shipment and fill them with water, and I find that with manufacturers who pride themselves

*Read before the sixth annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, held in Milwaukee, Wis., Feb. 6, 7 and 8, 1911.

on turning out good castings there is very frequently a defective one. They claim they can't be sure of a perfect casting, the brass may be spongy or the core misplaced a trifle, or something adhere to it between the time it leaves the core-maker and the placing of it by the molder, also blow-holes will frequently occur, and they cannot rely on their employees testing every one. Some claim this danger is avoided if these partitions are of seamless drawn-brass or lead, instead of cast, and that the outside of the trap will eat away or leak before the inside is affected. I admit that the danger is minimized, but not avoided, for so long as you must rely on the human element there is the danger of brazed tubing being substituted for drawn, with the possibility of the seam opening up. I have personal knowledge of several manufacturers sending out different traps than those which have been approved by plumbing inspectors or examining boards, both as to material and construction. So much for the secret partition feature of this topic.

Second: Deflecting provision or appliances. These can again be subdivided into those whose position, independent of any defect in material, is such that they will naturally retard the flow of the waste discharge and gradually become inefficient through adhesion of grease and soap, etc.; those with stand-pipe or deflector that will naturally enable hair and lint to twine around them in such a manner as to lose their water-seal through capillary attraction; and those which are so placed as to require a defect in the deflector to render them dangerous. To all of these the same objections apply as to the secret partitions, the possibility of a defect which would allow a pin or anything similar to find a lodgment and gather hair and lint to accumulate, producing loss of water seal through capillary attraction in a deflector to which otherwise there could be no objection.

I am aware that there are those who will admit all of the foregoing and still say: "Suppose these conditions do exist, do you think people will tolerate them without reporting them, and having them remedied?" For such I have two replies. First, there are ignorant people, who are entitled to all the safeguards we can throw around them for the protection of others as well as themselves, who would think that the odors emanating from such fixtures were a natural condition of plumbing installation, and would take no steps to have the trouble remedied; and second, that the man who can reason along that line is not fit to be trusted with the enforcement of any plumbing ordinance. Having, I trust, thoroughly convinced you that such traps are dangerous and ought to be prohibited, I want to call your attention to the fact that there is absolutely no justification for tolerating them at all. There is an abundance of styles, both plain and resealing traps, without secret partitions or deflectors, on the market at the present time to meet all demands for close connections and adjustability, and in view of the fact that even the perfect trap is recognized in our modern systems of house-drainage as being the weak point at which sewer-air may enter the house through evaporation or loss of water-seal by capillary attraction, what possible justification can there be in permitting traps with secret partitions or deflectors to be used at all, except where the seal of the trap is plainly visible? I would also call the attention of this society to the fact that many members are here representing cities which are willing to go to the expense of sending you here to secure such information as will enable you more intelligently and economically to administer your office in the public interest, while the sanitary engineers are looked to oftentimes for advice in laying out house-drainage systems in places where there is no official supervision. In the event of a lawsuit following a claim for damages for faulty construction, what possible defense could you make if you had allowed the installation of traps which are universally condemned?

I should feel this paper incomplete if it did not allude to the fact that many papers throughout the country are refusing to print advertisements of wares that are dangerous to health. I suggest that this society urge the trade papers to use greater discrimination in advertising any article that is manifestly dangerous, and also that it send a communication to the treasury, war and navy departments, asking them to amend their specifications so as to prohibit secret partitions or deflectors in traps, for we must not forget that when the seal has leaked away we have a one and one-half or two-inch full opening to admit sewer-air, beside which a sandhole in a soil-pipe is as a mole-hill to a mountain.

NOTES FROM OHIO.

Hilliard, O.—The clerk of the village will receive bids Oct. 2d for a complete sewage system. The cost of the work will be in excess of $10,000.

Portsmouth, O.—Plans and specifications are being prepared by Devoss & Wilson for the installation of a new heating and ventilating system in the Eleventh street school building, to take the place of an antiquated system.

Columbus, O.—Bids will be received in the near future by Architects Stribling & Lum for the heating and plumbing for a six-apartment building at 203 East Gay street. The system of heating will be by hot water.

Wooster, O.—The Ohio Experimental Station has prepared plans and specifications for a $10,000 system of water-works for the use of the station.

Newark, O.—W. F. Webber, formerly associated with O. Teaff, has disposed of his interest in that firm and opened a plumbing establishment in the Mayflower building.

Toledo, O.—The Larsen & Wood Co. has been incorporated with a capital of $10,000 to do a general plumbing business, including the installation of heating and ventilating systems and to do gas-fitting and steam-fitting. In addition the concern is empowered to handle supplies for plumbers and gas-fitters. The incorporators are: Neils S. Larsen, James A. Wood, William J. Fritsche, Mark Winchester and William L. Billingslea.

Columbus, O.—The discovery has been made that the provisions of the Crosser Initiative and Referendum law, passed at the last session of the Ohio General Assembly, will hold up all public improvements for a period of 60 days. This will affect not only street improvements but all matters having to do with water works extensions and sewering. Many cities and towns in Ohio were preparing to lay a large amount of water mains and to build new pumping stations, but this work will be held up for two months.

Akron, O.—Councilman Short recently introduced a resolution in the city council for a new water works system, to cost in the neighborhood of $1,500,000. This amount will be increased before the ordinance is adopted to $3,000,000. The resolution was referred to the general improvement committee. The ordinance is the result of a long petition signed by many of the leading citizens of that city praying for relief from the present intolerable conditions.

Not in Trigant.

When William F. Sheehan was a candidate for the United States Senatorship in New York one of the papers opposed to him printed the statement: "Sheehan is a born intrigant."

"He is not!" wrote an indignant friend of Sheehan from Buffalo. "He's Irish and he was born right here in the First Ward!"—Saturday Evening Post.

IMPROVING A PIPE RADIATOR.

By W. H. Wakeman.

Having had considerable trouble with a pipe radiator consisting of five 1½-in. pipes screwed into headers, the outlet of which is shown in Fig. 1, it is quite possible that an explanation of results secured may benefit others who are interested in operating heating systems.

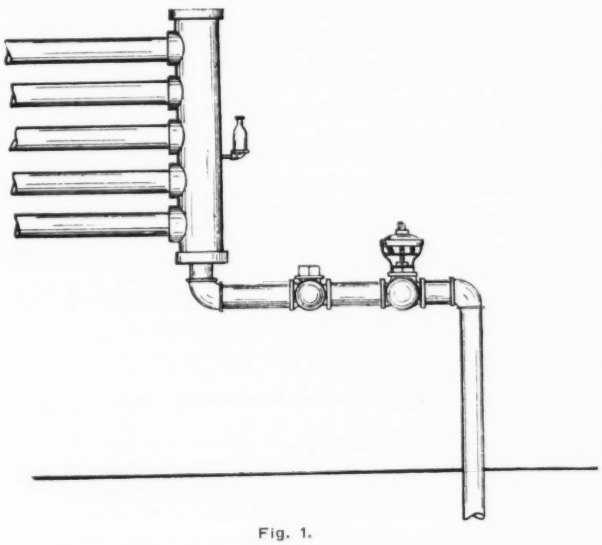


Fig. 1.

The drip, which consists of 1-in. pipe, carries a check-valve to prevent steam from backing up from the main return-pipe before the radiator is free from air. If this precaution were not taken, the air-valve shown would be heated by steam coming back through the drip-pipe, thus closing the outlet by expansion while one or more

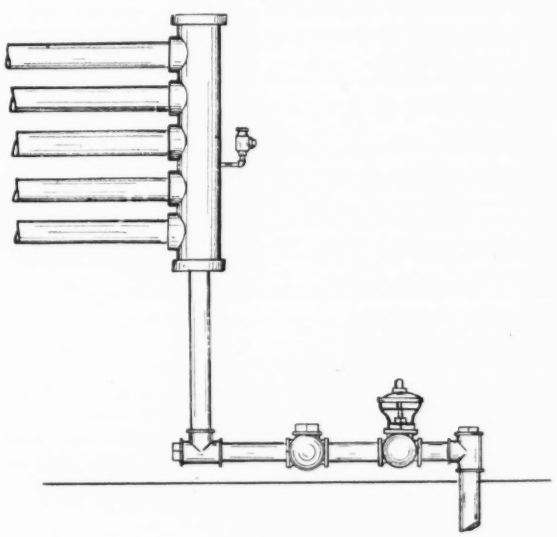


Fig. 2.

pipes are full of cold air. This not only prevents heating the room rapidly, but causes water to accumulate until some parts of the pipes that were full of steam become filled with water, which soon cools and renders more of the heating surface useless.

In the illustration, this check-valve is only a few inches below the lower pipe in the radiator, and as it requires a column of water several inches high to give pressure enough to open a check-valve, this water backs up into the lower pipe mentioned. On several occasions these drip-pipes have become choked with pieces of loose scale which have flaked off from the inner surface of the iron. Under such conditions, how can we tell which of the two evils is causing the trouble?

To prevent the former, the check-valve was lowered nearly to the floor, as shown in Fig. 2, consequently water can stand in the vertical pipe and open the check-valve without reaching the lower radiator pipe. At the same time the two tees with a plug in each, as shown in Fig. 2, were substituted for the ells in Fig. 1. By shutting off steam it is now possible to remove the plugs and clean sediment and scale out of the drip-pipe in a few minutes without breaking any of the pipe joints.

The air-valve shown in Fig. 1 is made of such light material that when a thread is cut on the shank it is almost cut in two, consequently a slight pull or push on it by a thoughtless person, breaks it off. I have lost many air-valves in this way, hence have secured the more substantial kind shown in Fig. 2. At first these were screwed directly into the header, leaving the outlet looking downward, but this caused a few drops of water to appear on the floor during the day. While this did no special harm, it was a nuisance on general principles, and to overcome it a nipple was screwed into the header, followed by an ell which received the air-valve in an upright position. Water now runs back into the header, which is much more satisfactory.

NEW BUSINESS VENTURES.

New Orleans, La.—Mailhus & Co. has been incorporated with a capital of $10,000. The officers are: Joseph L. Gautreaux, president; Joseph Mailhus, vice-president.

Black River, N. Y.—Schofield & Trenham is the style of a plumbing firm which has just started in business in the Graham block.

Sioux City, Ia.—W. A. Schroder, formerly with Hunt & Scheutz, has gone into business for himself under the firm name of the Ideal Heating & Metal Works. His address is 506 Pearl St.

Gilbert, Minn.—L. L. Johnson has left his plumbing shop here in charge of Jack McGinn, who has been in his employ for some time, and has opened a new establishment in East Duluth, in the portion known as Lakeview.

Ridgewood, N. J.—Wm. P. Morgan Plumbing Co. has been incorporated with $25,000 to conduct a plumbing and heating business. The incorporators are Wm. P. Morgan and A. Morgan, both of this city, and J. W. Dwyer, of Paterson.

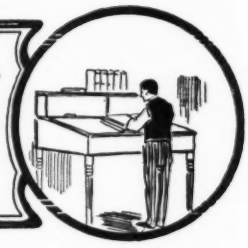
Memphis, Tenn.—The Burmeister Plumbing Co. has been incorporated with a capital of $2,500. The incorporators are F. A. Burmeister, J. E. Holmes and W. B. McCarthy.

Cleveland, Ohio.—The Jepson Bros. Co. has been incorporated with a capital of $45,000 to do a general plumbing, heating, ventilating and gas-fitting business. The incorporators are: James E. Sayne, Peter G. Jepson, Anna D. Jepson, Richard J. Jepson and Minnie A. Jepson.

Washington, D. C.—Following his resignation several months ago as an assistant inspector of plumbing for the District of Columbia, Joseph Whelan has opened up a plumbing establishment at 473 New York Ave., N. W., in partnership with Samuel Simmons. The new firm is doing business under the name of Whelan & Simmons and reports a good amount of work on hand. It will be pleased to receive catalog and other literature from manufacturers of plumbing, gas fitting and heating supplies.

BUSINESS MANAGEMENT

NEW METHODS FOR OLD



HOME-MADE EXPERIENCE.

Having been a reader of your paper for a number of years, I thought that perhaps a bit of my experience might be of interest to the readers.

About 30 years ago I decided to change my occupation in life. Things had not been panning out very well in the line I had been following, and the outlook for the future was leaner than a whole bunch of old Pharaoh's starved kine in the off years. I put that in for literary effect.

In looking around for something new, I chanced, one evening to see an advertisement which attracted my attention. It was a clear description of a new steam boiler that had just been placed on the market, and told what it would do. The next morning, when I went downtown, I wrote to the manufacturers for further information. A few days later there walked into my office one of the finest specimens of manhood that I ever put eyes onto. He was a typical New Englander, and turned out to be one of the best friends that I ever had in business life.

John Gaze (we'll call him) invented over a dozen different patterns of steam boilers, and all were mighty good ones. At this time he was just getting some of them introduced in different parts of the country, and he wished me to take hold of the matter in my city, in his interest.

After thinking the matter over, I decided to give the deal a try-out, and so ordered a boiler and radiators. In due time the goods arrived, and I made up my mind that I would put in the first job in my own house. The inventor of the boiler wrote me that he would come on and assist me on the job, as I was a perfect greenhorn in the matter at that time. So I managed to scurry around and get together the pipe, fittings and a set of old solid dies. I borrowed a vise of a blacksmith and was ready for business when the inventor arrived in our city. I have to laugh even now when I think of how we pulled and hauled on that job, with those old solid dies. Say, they were regular man-killers, and all that two strong men could handle to put on an inch and one-half thread. However, we kept pulling away at the job and finally got it in all right, and I am using the same today.

Now that I was a full-fledged steam-fitter, and had the trade down fine, I began to look around for business, and to wonder when and where I could get it. After canvassing the city, I found a man who wanted to heat his dwelling; so I asked him to call at my house and look over my steam job. When he came, I showed him around, and he appeared to be pleased with the work; he placed his hand on one of the radiators, but did not hold it there very long. I then explained to him the working of the boiler, taking care to dwell upon the manner in which the automatic damper worked, for that was a new thing in those days, and a good talking point. The customer could scarcely believe his eyes when I showed him the small fire I was carrying to heat the house, and I thought that I had him nailed for keeps, but when he asked "how many other jobs have you in the city?" I had to confess that the one he saw was my one and only. That killed the deal, for he decided to wait until I had more experience, so I lost out there at that time.

Afterwards, I had the satisfaction of doing over a job that this same man had installed in his house, by what was called a "cracker-jack" steam-fitter from one of the big cities down state.

After hunting around for some time, I found a second customer, and he put up the same line of talk about my "lack of experience." "Say," I remarked to this "doubting Thomas," "I am going to put this job in your home, and if it don't do just as I tell you, you need never pay me a cent." With that understanding the job was put in, and as good luck would have it worked fine. A more pleased man you never saw, and he used his influence for me ever after. He would tell every one that came into his place of business about that job of his that I put in, with the result that I got two more jobs that season before business closed down. Talk about advertising! He was a regular phonograph, and running overtime at that. I then bought a set of good tools; adjustable dies, real pipe wrenches and a first-class pipe vise, and was ready for business all right. The business gradually grew into other towns and cities, me getting more wise to the same with every job. I have done work in many counties in the state, and, at times, have gone several hundred miles away to put in work. Have been up against opposition of all kinds, but the worst is the people in the hardware business. Their tinners, plumbers and fitters don't look good to me, and many of these hardware merchants do not know how to estimate a job right. However, in spite of that, I put in sixty-five residence jobs in one city, and the hardware men under-bidding all the time. I have not done this work without considerable study. It was up to me to get wise as fast as I could, and to the greatest extent. Many years ago I began to read the trade papers, and found them a great help to me in every way; so I would advise all in the business to read them.

"An Old-Timer."

HAVING A LIST FOR THE TOOLS.

Editor "Domestic Engineering":—One of the most exasperating moments that happen between employer and the fitter is usually due when the fitter gets out on the job and finds that he has "forgotten" to obtain some tool that he needs. It may be an oversight, but there are some fitters who could not make out a correct list of tools to save their necks.

While I am aware that some masters are foolish enough to use the making out of a list as a sort of test as to the fitter's ability, I believe that it is a short-sighted policy and costs more than it comes to. You can question the man and soon find out what he don't know. In our shop we have, for some time, had printed lists of the tools that would be needed for the fitter and the plumber. These lists can be very quickly consulted and can be used in checking up the tools. We find that it saves a great

amount of annoyance and considerable hard feeling, and also not a little lost time in chasing back to the shop for some tool, "that I forgot to order." Once or twice I have met a journeyman who was far-sighted enough to have a copy of such a list in his pocket, which he had written out for himself. Such men are mighty few, though, I have found.

Madison. J. C.

THE OTHER SIDE OF THE TEN PER CENT CREDIT SYSTEM.

Editor "Domestic Engineering":—There are always two sides to a question, and there is no exception to the rule on the ten per cent credit-system question. In the August 26th issue of your journal we hear one side of the story, that is, the side of the jobber, and two jobbers comes across with letters telling us how fine this ten per cent system works. Now I do not know anything about conditions in Indianapolis, and I do not want to criticise the jobber that wrote the letter from Minneapolis, as he (the Minneapolis jobber) may be on the square, may be following the rules, but, kind reader, take it from me (from one who knows) conditions in Minneapolis are rotten.

Now some of you will think that I am a knocker; you may call me a pessimist and think that I ought to be an optimist, but then what's the difference? The optimist sees the doughnut, while the pessimist sees the hole—they're both all right. No hole, no doughnut. Now, if I were to tell all I know about the ten per cent system, this paper would have to get out an extra edition, so I will leave some things unsaid.

In the first place, remember that goods bought in carload lots are not included in this system, also remember that goods bought for use out of town are not in this system. This may not make a great deal of difference, but now you know it; the Minneapolis letter-writer did not mention this.

Here is another one: Some of the Minneapolis jobbers who are in this ten per cent deal take notes not only on the 2 per cent account, or old accounts, but on new current 10 per cent accounts, and remember, they allow full discount. As for putting the unbusinesslike fellow where he belongs, this ten per cent deal has not accomplished anything, there are just as many small and unbusinesslike dealers in the business as there ever were; the little fellow without capital is figuring just as much work as ever, remember, too, that he is getting just as much work as ever, and some of the fellows who are starting in with very little capital are doing just as big a business as the big fellow with the dough.

Here is another thing: Some of the jobbers take owners' garantees in cases where the plumber is no good, practically selling to consumers; there are also some who sell to journeymen plumbers. Now, boys, here is the newest: In the first place let's only trade with the jobbers who sell only to master plumbers, then let's get them to adopt rules something of this sort:

All bills must be paid on the 15th of the following month and are then subject to 10 per cent. If a plumber does not pay on the 15th he is put on a cash basis, until the 1st of the following month. Remember he must in the meantime pay up his ten per cent account, that is, it must at least be paid by the first of month following discount date, and, of course, he loses his discount. If he does not pay up by the first of month following discount date, he is put on the cash basis for at least six months, then if he gets in shape again and is entitled to credit, it will be up to the jobbers to reinstate him. If he don't get in shape, he will be on the cash list forever.

Remember, also, that no notes, owner's garantee, or turning over of liens goes, in fact, nothing but cash or the plumber's check.

This ten per cent deal is all right if it will do what it is supposed to do, but it doesn't.

Minneapolis, Minn. "The Office Boy."

WE KNOW IT.

We thank "One Who Does Plumbing and Pays His Bills" for his letter of recent date. We received word concerning the suspension of the system and its possible restoration. In any case, our readers all over the country are interested in all systems that promise betterment of their conditions, and in that respect the article in question has served its purpose.

ADVERTISING THAT MEANT WELL.

Advertising is a good thing, but a knowledge of the English language and the relations of words is helpful in the compiling of the advertising. Ignorance on this score is often responsible for many laughable effects, as the following advertisements will testify:

These soap-holders are the best. Try one for 50 cents and be convinced for 30 days.

These attractively enameled bath-tubs will appeal to every lady five feet long.

This plumbing and heating business will be carried on by Sam Jones succeeding H. Taylor who died last week on a new and improved plan.

Wanted, for the summer, a cottage with a small family with good sewers.

Wanted—Two plumbers to work on country residence. One must be sober.

Want bids on new heating boiler by practical steam-fitter with 1,200 ft. of radiation.

For Sale—Plumber's delivery-horse. Quite suitable for lady with a switch tail.

Lost—By a journeyman plumber, tied up in brown paper with a white string a kit of tools with an overcoat.

Personal—If the steam-fitter killed in the boiler-explosion last week will have his executor call at 43 S. Green St., he will hear of something to his advantage.

Personal—Plumber's widow in comfortable circumstances wishes to marry two sons.

To Rent—A plumber's establishment containing eight rooms a good shop and an acre of land.

Wanted—A sober and industrious driver for plumber's shop who can care for four horses who can speak German.

MILWAUKEE CONTRACTS.

The following plumbing and heating contracts will soon be awarded in Milwaukee, Wis., as bids are now being received: Architect Chas. J. Keller, 517 Germania building, for William Oldenburg, Lake Drive, furnace heating; Architect F. A. Andree, jr., 77 Cawker building, for bungalow, furnace heating; Reinold Bros., 2630 Lisbon Ave., steam-heating for store and office-building; Architect H. C. Hengels, 702 Grand Ave., for John J. Bartz, hot-water heating; Architect H. W. Buemming, 521 Jackson St., for Joseph R. Dyer, hot-water heating; for residence in Sheboygan, hot-water heating; for bank building, Heinemann estate, steam-heating; for Edw. F. Goes, Pine Lake, furnace heating; Architect A. J. Seeler, for Carl Seebach, furnace heating; Architects Van Ryn & DeGelleke, for heating and plumbing for the school addition at Cudahy, Wis.

THE METAL MARKET

INCREASED PRODUCTION OF PIG-IRON.

Pig-iron production increased during the month of August but the increase was wholly made up of steel-making irons. The production of coke and anthracite iron amounted to 1,926,000 tons. The production of the steel companies increased 4600 tons daily compared with July, whereas the furnaces making foundry iron showed a decrease of about 350 tons daily. The activity of the steel industry at the expense of the foundry trade has been noted all the month. The foundries are not likely to take any interest in the market for some time to come, as their wants for the remainder of the year seem to be fairly well satisfied and there is no incentive to purchase for next year's requirements. Then, too, no rapid advance in price can be expected as long as there is so much idle blast furnace capacity. Prices in New York are without change from last week as follows:

No. 2 Southern foundry, Birmingham	$10.00 to	$10.25
No. 1. Northern foundry, New York	15.50 to	15.75
No. 2 Northern foundry, New York	15.00 to	15.25
No. 2 plain, Northern foundry, New York	14.75 to	15.00
No. 2 Northern foundry, Chicago	14.50 to	15.00

OLD IRON.

The market is very dull and consumers have not acted in the market unless concessions could be obtained from prevailing prices. Lower quotations prevail on foundry stock. Prices are as follows:

No. 1 yard wrought, long	$11.00 to	$11.50
No. 1 yard wrought, short	10.00 to	10.50
Heavy-melting steel scrap	10.25 to	10.50
Machinery cast	10.50 to	11.00
Wrought pipes and tubes	10.00 to	10.50
Malleable castings	10.50 to	11.00
Wrought turnings	6.75 to	7.00
Cast borings	6.00 to	6.50
Stove plate	8.50 to	9.00
Light iron	4.25 to	4.75

LEAD.

The market is steady and without change, the price in New York being 4.50 cents and in St. Louis 4.42½ cents.

THE TIN MARKET NORMAL.

Heavy arrivals recently have replenished the meagre stocks of tin held in this country and the price has dropped about 1 cent a pound during the week. The present quotation of 41.25 for tin in 5-ton lots New York is on a parity with the London quotation for spot tin. The consumption of tin continues large.

SPELTER.

There is undoubtedly considerable manipulation in the spelter market and prices of spelter have again declined. In New York it can be had at 5.95 to 6 cents and in St. Louis at 5.75 to 5.80 cents.

A STEADY COPPER MARKET.

Some sellers of electrolytic have made a few good sales at 12.50 cents for spot delivery in New York. On the other hand, certain other dealers have been holding out for 12.55 to 12.60 cents. Some of the larger consumers are actually short of supplies and a new buying movement would not be unlikely toward the latter end of the month. The European situation seems better and prices there are little changed from a month ago. Lake is held at the unchanged price of 12.75 cents, but electrolytic is 12.50 to 12.60 cents. The exports for August amounted to 29,000 tons. The statistics compiled by the Copper Producers' Association were favorable to the holders of the metal.

OBITUARY.

Joseph A. Garwood.

Joseph A. Garwood, who has conducted a plumbing business at Trenton, N. J., for the past 30 years, died Aug. 22nd, while on a visit at the summer home of his sister, Mrs. Anna Hopper, Asbury Park, N. J.

Michael H. Baker.

Michael H. Baker, who supervised the laying of the first water-main in the city of Holyoke, Mass., died at his home in Northampton, near Holyoke, on August 27th. He was 63 years of age and had been engaged in the plumbing business nearly half a century. He located in Holyoke in 1875. He retired from business two years ago because of ill health.

Thomas J. Newman.

Thomas J. Newman, the oldest plumber in Cincinnati, O., died at his home, 759 Kenyon Ave., in that city, on August 22d. Mr. Newman was 83 years old, but until a few months ago was actively engaged in business. He was born in County Louth, Ireland, and when seven years old came to New York. In 1850 he moved to Cincinnati, entering the plumbing business two years later. Mr. Newman is survived by two sons, four daughters and seven grandchildren. His wife died a little over a year ago.

John Wonder Hays.

John W. Hays, senior member of the plumbing firm of Hays & Eastman, Monmouth, Ill., died on September 3d from apoplexy after only a few hours' illness. For the past year Mr. Hays had not been well, and he recently spent several weeks at Excelsior Springs, Mo., for treatment. He retired Saturday in apparently his usual health, but early in the morning became so ill that a physician was summoned at once, and it was realized that his case was hopeless. Mr. Hays learned the plumbing trade early and became an expert in sanitary engineering. About twelve years ago he entered into partnership with I. M. Eastman, the firm employing a number of men and handling many important jobs, among which may be mentioned the plumbing of the Monmouth College buildings, considered one of the most sanitary jobs in that section of the state. Mr. Hays was born in Peoria in 1873 and has lived in Monmouth since 1875. He was one of the leading men in business, social and fraternal circles, being an active worker in the B. P. O. E., Mystic' Workers and the Red Men. He leaves a widow and three children.

Lincoln, Nebr.—A new plumbing ordinance has been proposed but has not yet been acted on by the city council. It provides for a plumbing inspector, whose salary of $1,500 a year would be met by the house-builders and not charged against the tax-payers generally. The ordinance contains 125 separate rules governing materials and methods of installation. It is believed that even if it passes the council it will not meet with the mayor's approval, as it is considered likely to increase the already too high cost of plumbing work.

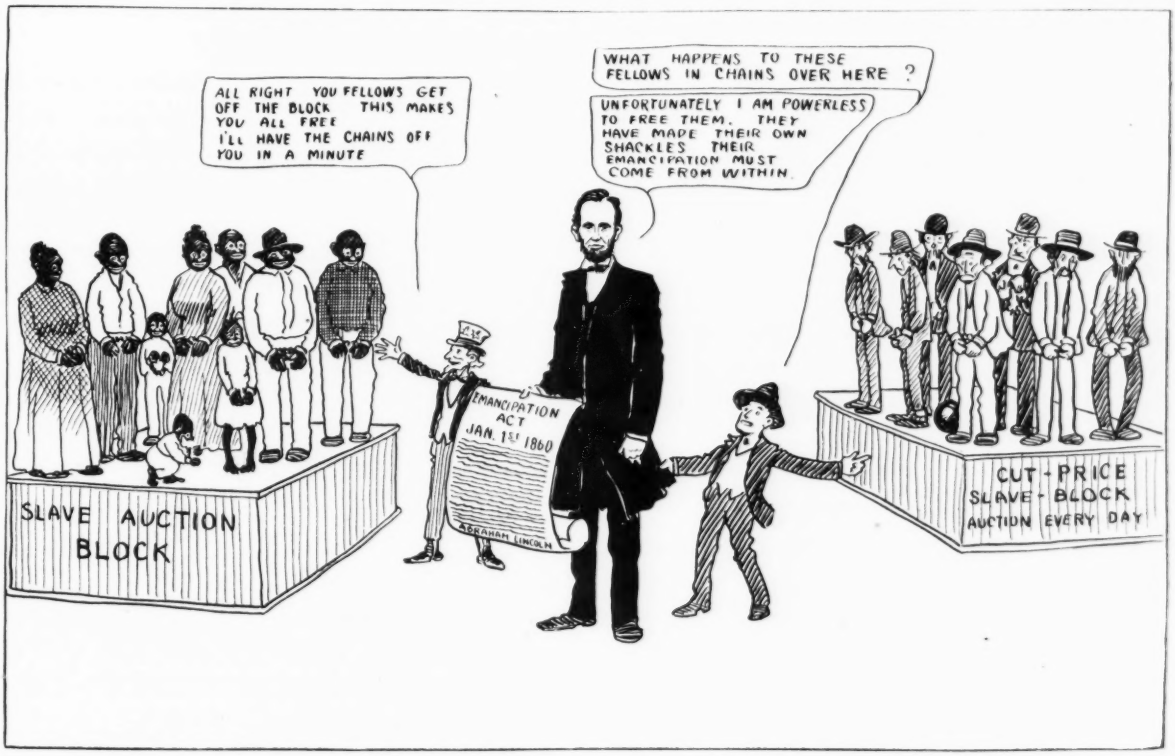
Domestic Engineering "First-Aid-to-the-Injured"

Postal Card Cartoon—No. VI.

Price-Cutting Slavery.

From Maine to California, from Northwestern Michigan to Florida's southernmost tip, these cartoons are being called for. There's a reason—THEY HIT THE BULL'S EYE.

Scores of live plumbers and steam-fitters are using these to evangelize their respective territorties with the gospel of Profitable Prices for Good Work.


ALL RIGHT YOU FELLOWS GET OFF THE BLOCK THIS MAKES YOU ALL FREE I'LL HAVE THE CHAINS OFF YOU IN A MINUTE
WHAT HAPPENS TO THESE FELLOWS IN CHAINS OVER HERE ?
UNFORTUNATELY I AM POWERLESS TO FREE THEM. THEY HAVE MADE THEIR OWN SHACKLES THEIR EMANCIPATION MUST COME FROM WITHIN
EMANCIPATION ACT JAN. 1ST 1860
ABRAHAM LINCOLN
SLAVE AUCTION BLOCK
CUT-PRICE SLAVE-BLOCK AUCTION EVERY DAY

Is Lincoln Saying This About You?

Many a man will listen to a picture whose mental ear-drums could not be pierced by an army of graphophones. You can reach people you can't talk to by sending out 25 of these or any other quantity you name. We will send them to you free of cost. Nearly 20,000 have been distributed up to date. This cartoon should prove a winner.

PITTSBURGH SANITARY MFG. CO. ENLARGES ITS PLANT.

The Pittsburgh Sanitary Mfg. Co., Pittsburgh, Pa., has added a new furnace to its plant at New Kensington, Pa. The company states that this addition will enable it to double its output.

WILL MAKE "RYAN" BALL-COCKS FOR CANADIAN TRADE.

The James Morrison Mfg. Co., Toronto, Ont., has purchased the right to manufacture the "Ryan" ball-cock for the Canadian trade from the Exeter Brass Works, Exeter, N. H. The manufacture will be started at once and the ball-cock will soon be on sale at the jobbers in the leading Canadian cities.

NOW WITH THE CANTON BRASS & MACHINE CO.

D. B. Whittingham, for many years connected with the brass business and recently superintendent of the United Brass Mfg. Co., Cleveland, O., is now general manager of the Canton Brass & Machine Co., Canton, O. Mr. Whittingham reports a new line of plumbing specialties well under way and expects to present it to the trade in the near future. This concern will also manufacture aluminum castings.

THE WILLIAMS TOOL CO. ENLARGES ITS PLANT.

The Williams Tool Co., Erie, Pa., is thoroughly satisfied with the development of its business, and has a profound confidence in the continuation for the demand for its products, and has shown it by placing a contract for the erection of a fireproof factory building, 65 x 125 ft. This new structure will adjoin the present plant and will enable the company to double its output. The addition will be completed and ready for occupancy by the first day in 1912.

JAS. B. CLOW & SONS TO OPEN THEIR NEWCOMERSTOWN, O., PLANT.

James B. Clow & Sons will open up the radiator factory of their Newcomerstown, O., plant at once because of the number of orders received at the Coshocton, O., plant, which cannot be filled there. The superintendent of this department, Mr. Mugford, has been transferred temporarily to the Newcomerstown plant. The radiation work has not been installed in the Coshocton plant, but new machinery for this department has been received and it is being tried out. As soon as it is finished the work will be started there and the Newcomerstown radiator-shop closed again, according to a statement made by Supt. Aland recently.

MARK-LALLY CO. DECIDES TO ERECT FOUR-STORY CONCRETE BUILDING.

The architect who recently accompanied H. T. Lally to Chicago to assist in settling the differences of opinion in regard to the type of building to be erected by the Mark-Lally Co., San Francisco, Cal., has returned to San Francisco and is now busy making a few changes in the original plans. This work will be rushed to completion at the earliest possible date and bids will then be invited. The structure as decided upon will be reinforced concrete, four stories in height. The lot of now ready for building operations and work will be rushed with all speed as it is desired to vacate the present quarters as soon as possible.

MEETING OF THE BOARD OF GOVERNORS OF THE A. S. H. AND V. E.

At a meeting of the Board of Governors of the American Society of Heating and Ventilating Engineers, held September 9 in New York City, applications for 19 candidates for membership were approved and the following members of the society were appointed to represent it at the Third National Conservation Congress, to be held at Kansas City, Mo., September 25, 26 and 27: J. H. Kinealy, Chairman; J. H. Kitchen, B. C. Davis, J. M. Kent and A. H. DeLanney.

PERSONAL MENTION.

C. C. Johnston has been appointed manager of the Pittsburgh branch of the United States Radiator Corporation, in place of F. M. Mechling, who has resigned. Mr. Mechling was formerly with the United States Boiler & Radiator Co. and at the time of the consolidation was placed in charge of the Pittsburgh territory, where his long acquaintance with the heating business and his genial personality made a great many friends, and it was with a great deal of regret that the corporation accepted his resignation. Mr. Johnston was formerly with the Herendeen Manufacturing Co., traveling through Ohio a great many years, and is well known in that part of the country. His advancement to position as manager is well deserved and his vigor and enthusiasm will be sure to win him success in his new position.

Chas. A. Yinkey of the Novelty Iron Works, Canton, Ohio, met with a serious accident while on an automobile ride with E. W. Webster, a well known master plumber, at Du Bois, Pa. While going at a high speed an axle broke and Mr. Yinkey was thrown a distance of about thirty feet, which resulted in a broken arm, a fractured breastbone and a crushed foot. He was removed from Du Bois, Pa., to his home at Wooster, O. It is expected that he will be able to be out again about the middle of October. Mr. Yinkey is one of the best known heating salesmen in Ohio.

J. S. Sullivan, a well-known pump salesman, has recently accepted a position with the Buckeye Pump & Mfg. Co., of Columbus, O. He will call on the trade in the middle West.

OFFER FACTORY SITE TO BLAKE SPECIALTY CO.

The board of control of the Industrial Commission of Rock Island, Ill., has decided to recommend that a factory site consisting of five lots in the Manufacturers' addition in the west end of the city be given to the Blake Specialty Co. upon the condition that the company is to build a $10,000 factory there, employ an average force of 50 men and show a yearly payroll of $25,000. The Blake company is willing to accept the site on these terms, and it is expected that the matter will be arranged in the near future. The Blake Specialty Co. is now located at 2410 Third Ave., Rock Island, Ill. It makes and sells plumb-

ing specialties, and though the business has been established only a few years it is growing very rapidly. The officers of the company are: J. T. Shields, president; John D. Blake, vice-president, and M. C. Shields, secretary and treasurer.

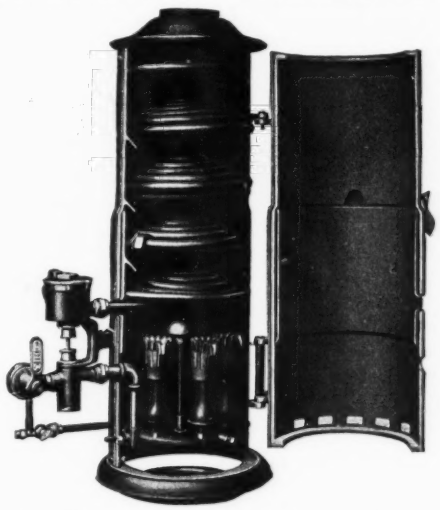
RUSSELL SEWAGE DISPOSAL CO. OPENS CHICAGO OFFICE.

The Russell Sewage Disposal Co., Burlington, Ia., has opened a branch office at Suite 607, Marquette Bldg., Chicago.

THE NEW "PITTSBURG BUNGALOW" AUTOMATIC GAS WATER-HEATER.

The Pittsburg Water Heater Co., Pittsburgh, Pa., realizing that a demand existed for an automatic water-heater that would furnish an abundance of convenient hot water for bungalows, cottages, apartments, etc., at a price suiting those of moderate means, has recently put on the market the "Pittsburg Bungalow" gas water-heater.

The "Bungalow" is particularly adapted for small residences, bungalows, or flats, where the hot-water fixtures are all on one floor. It has staggered copper coils, highly



The "Pittsburg Bungalow" Gas Water-Heater.

efficient Bunsen burners, patented back-draft deflector and durable cast-iron shell. The manufacturers claim that it is positively automatic in operation—the turn of the hot-water faucet controlling the gas in the burners. The heater is of a very neat design, the shell being constructed of cast-iron, baked, black Japan finish.

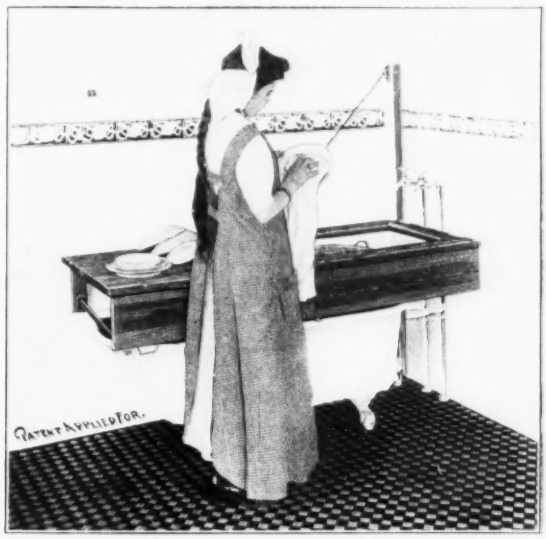
The heater is usually placed in the kitchen, and will supply not only the kitchen with hot water but the bath room as well, and for this reason the manufacturers think that it will eventually replace the familiar type of bath-room heaters.

ENGINEERS' HANDBOOK AND CATALOG.

The George H. Tay Co., San Francisco, Cal., is supplying to the trade an imposing volume classed as an engineers' handbook and catalog. It contains nearly 800 pages, and the index, which is very complete, shows that the contents of the book include everything required by the engineer in his daily work. To give an idea of its extent, there are nearly 150 pages on valves. Several interesting types of steam-traps are shown, and the Kieley low-pressure grease-trap is quite interesting. Oil and grease extractors, separators, lubricators, grease-cups, radiators, pipe-fittings—all these receive attention and the work concludes with many pages of tables and regulations, all intended to assist the steam-fitter. The book is well worth writing for, and should be ordered before the supply is exhausted. It will most assuredly do what the Tay company intended it should do, and that is, increase the demand for Tay products.

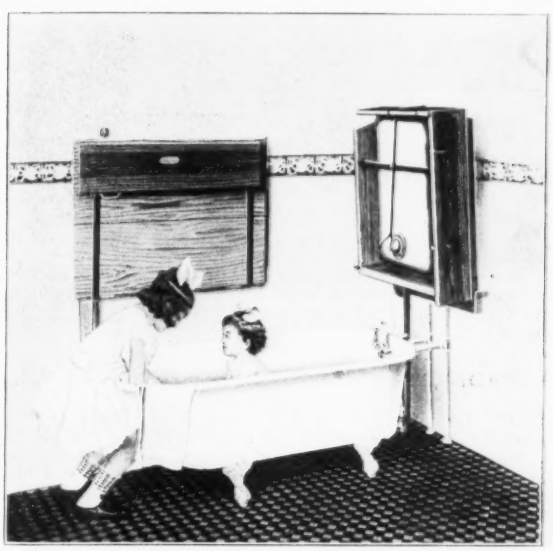
"SINK AND SWIM."

The Sink & Swim Co., 2717 Massachusetts Ave., Cincinnati, O., has done away with a formidable alternative. We were always told that we had to sink or swim. The company declares that we can do both and still keep on



The Combined Sink and Bath-Tub. Sink in Use.

living. The illustrations will tell the story. The company's product is a combined sink and bath-tub. Fig. 1 shows the sink in position for use, directly connected to the waste. Fig. 2 shows the sink out of the way and the privileges of the tub being enjoyed without let or hin-

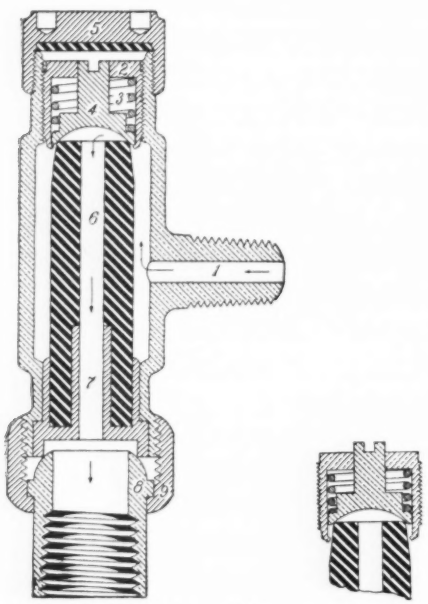


The Combined Sink and Bath-Tub. Bath-tub in Use.

drance. The Sink & Swim Co. wants to introduce this to feminine domestic engineers, through the man who should reach them, and that man is the plumber. Illustrated literature and specific description can be obtained from the company. Mention "Domestic Engineering" when you write.

THE "TELWEN" VALVE.

The "Telwen" is manufactured by the Monash-Younker Co., New York and Chicago. The illustration will show its special construction, which is simple and effective. The small cut is interesting, showing how the danger of over-adjustment is avoided. The seat composing the compensating spring forces the screw-driver out of the slot of the screw. In the large cut the simplicity of adjustment is presented. The exact location of the seat in relation to the expansion-post at 6 is determined by the



Sectional Views of the "Telwen" Radiator-Valve.

projection or non-projection of the seat-stem at 4. The hollow screw, 2, is screwed down until the seat-stem rises, showing that the spring-controlled seat has come in contact with the expansion-post. The screw is then turned back until the stem is flush with the top of the hollow screw. The adjustment can be made with the valve unattached or attached to the radiator, and with or without the presence of steam. The manufacturers claim that the "Telwen" feature makes the valve absolutely "fool-proof," compelling its proper adjustment, saving time, trouble, and cost of repairs, and that the compensating spring-seat prevents the buckling or bending of the expansion member by undue pressure. Every valve is ready for attachment to the radiator and air-line pipe without further adjustment on the part of the steam-fitter. The Monash-Younker Co. issues literature describing the specific merits of the "Telwen" valve in detail, which can be had upon request. Mention "Domestic Engineering" when you write.

TRADE LITERATURE RECEIVED THIS WEEK.

The Standard Heating & Radiator Co., Pittsburgh, Pa., invites the trade to write for its catalog D. This is devoted to Standard gas-saving burners, designed for use in connection with steam and hot-water boilers and hot-air furnaces. Horizontal round burners are supplied for hot-air furnaces, the apparatus consisting of a combination of small independent burners, each with an individual mixer. The sections are small enough to pass through a fire-door opening, and installation in the fire-box of the furnace is easily accomplished. These horizontal round burners are made in any size from 10 in. to 28 in. Square and rectangular burners are also made for the other types of boilers and furnaces on the market, the individual burners being placed on longitudinal castings. Round upright burners are provided for round steam and hot-water heating boilers and hot-air furnaces. Catalog D illustrates and describes these different types and gives instructions for their satisfactory installation and operation. The manufacturers claim for the burners the production of heat equal to the capacity of the boiler or furnace, and economy of fuel. In writing for the catalog, mention "Domestic Engineering."

The Pressed Radiator Co. of America, Pittsburgh, Pa., has just issued an attractive booklet illustrating and describing the latest development in the manufacture of its pressed radiators. The slogan of the booklet is "On the wall—off the floor—out of the way." A number of illustrations show the plant and its various departments. Several excellent cuts of suspended radiation are given in one, two and three-column types, and the "Hecla" hospital radiator, two-column, for steam and hot-water, offers sanitary advantages by reason of a generous air-space between the sections. Copy of the booklet can be obtained upon request. In writing mention "Domestic Engineering."

The Detroit Lubricator Co., Detroit, Mich., is sending out a little booklet illustrating and describing its "500" lubricator for air-compressors. The lubricator can be started and stopped without changing the feed and pressure adjustments. Those interested in air-compressor lubricators will profit by studying the meritorious features of this device. The leaflet can be obtained from the company by mentioning "Domestic Engineering" when writing.

The Ideal Furnace Co., Detroit, Mich., manufactures "Ideal" furnaces and "Radiant" boilers. An attractive catalog sets forth by illustration and description the special constructive features and points of merit of both. The "Special" furnace is interesting, because of its driving-flue, introduced for the combustion of soft coal and wood. This type of furnace is also good for use with natural gas. The catalog concludes with a pleasing presentation of side-wall radiators, which are of attractive design, constructed so as to deflect the current of air into the room, preventing discoloration of the wall. By writing to the Ideal Furnace Co. you can get a copy of this catalog. Mention "Domestic Engineering" when doing so.

Brass fittings and unions are presented in a small booklet of the Kelly & Jones Co., Greensburg, Pa. The motto of the company is "Correct in every detail," and that motto, consistently followed out, means a good deal to the users of the goods. The booklet shows by illustration all the different standard and extra-heavy brass fittings, brass recessed fittings, brass unions and flange fittings. All dimensions are given, and the booklet is a convenient size so that it may easily be added to a man's file on brass goods. It is to be had for the asking. Mention "Domestic Engineering" when you ask.

CHICAGO PLUMBERS' STRIKE ENDED.

The plumbers' and steamfitters' strike in Chicago was brought to an end Wednesday night, September 13, at the Hotel Sherman, Chicago, by Simon O'Donnell and Martin B. Madden, the first the leader of the plumbers, and the latter of the steamfitters. The struggle was brought to a close because matters had reached a stage where the old organizations' interests were threatened by a new rival, the Independent Plumbing Co., which had the backing of building contractors and union men who were sick and tired of the state of affairs brought about by the prolonged strike. The agreement which O'Donnell and Madden signed is as follows:

"It is agreed that the parties of this agreement will have their members return to work on all jobs now on strike. The parties of this agreement also agree not to interfere with the shops or employees who are at present employing members of either the United Association of Plumbers or the International Association of Steamfitters pending the decision of the coming convention of the American Federation of Labor, which is to be held at Atlanta, Ga., in November."

Contractors estimate that the controversy has cost the city millions of dollars by preventing the construction of buildings for which contracts had been let. Many of the larger builders refused to start their work because with the trades in a constant wrangle they had no idea as to when it would be finished.

THE FLIGHT OF THE NEWS

CONTRACTS AWARDED.

Bloomington, Ind.—D. V. Mack has been awarded the contracts for the plumbing in Mrs. D. Miller's residence and in Samuel Bray's two new houses.

Watseka, Ill.—Chas. Eby has secured the contract for the installation of an up-to-date plumbing system in A. C. Cast's residence.

Augusta, Ill.—Fred H. Crain has been awarded the contracts for installation of plumbing and hot-water heating systems in the residences of F. H. C. Newcomb, S. W. Allphin and B. F. Hoyt. He also has secured the contract for the installation of a hot-water heating system in the public school building at La Prairie, Ill

Webb City, Mo.—The Swartz Plumbing Co. has secured the contract for the plumbing in the new high school building in this city.

Knoxville, Tenn.—James F. Long & Co. have been awarded the contract for the installation of a new plumbing system in the jail and the sheriff's residence. The consideration is $4,385.

Washington, D. C.—The King Heating Co. is installing the new heating system in the Lincoln National Bank building at 7th and D streets, N. W.

Freeport, Ill.—The Evans Plumbing & Heating Co. has been awarded the contract for the installation of a new heating plant in the court-house and jail in this city. The contract amounts to $1,018.

San Diego, Cal.—Schulteis Bros. have landed the much coveted contract for the installation of the plumbing and heating systems in the new county jail being erected. This contract is valued at $16,500.

Clarksburg, W. Va.—The East End Plumbing Co., 342 East Pike St., has just secured the contract for plumbing heating and gasfitting in the Star Rig, Reel and Supply Co.'s new plant at Hartland, W. Va. This contract includes the construction of a 2,500 ft. trunk sewer. The East End company has also secured the contract for the plumbing, heating and electric wiring of Miss Laura Winter's $12,000 residence at Bridgeport, W. Va. Geo. C. Bratton and H. H. Harrington are at the head of this successful plumbing concern.

PUBLIC-COMFORT STATIONS TO BE ERECTED.

Milwaukee, Wis.—Two $20,000 public-comfort stations at Grand avenue bridge on land owned by the city are being planned by a private corporation organized by Herman C. Schultz. The stations are to become the property of the city in ten or more years, according to the time fixed by the council. The plans are to build the stations two stories high, above the street-line for a store and below for accommodation of the public. These would be built on the order of the new Sixth street viaduct station opened recently. The plan of erecting a station on each end of the bridge will probably be accepted by the council, as the city attorney has declared the plan legal.

Akron, Ohio.—Work has been started on the construction of a public-comfort station at the corner of South Main and Market streets after months of quibbling. The contractors, Hunt & Wigley, will have it completed by fall. The cost will be in the neighborhood of $10,000. It will be constructed of marble and stone and will be under the sidewalk.

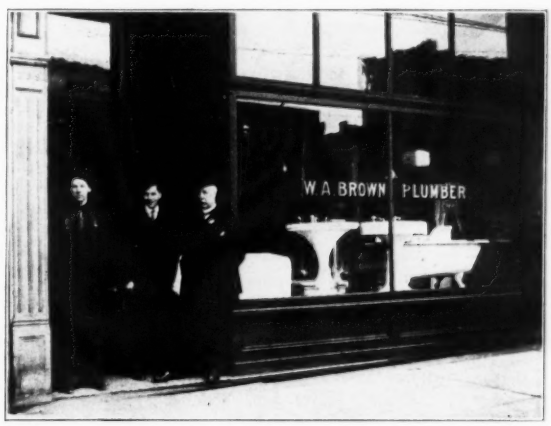
TWO VANCOUVER VIEWS.

Our representative, who has recently visited Vancouver, B. C., sends the two photographs herewith presented, so that readers of "Domestic Engineering" may see for themselves that business is flourishing in Vancouver. It is plain to be seen from the first view, that of Barber Bros., in Cedar Cottage, a suburb of Vancouver, that the artist arrived on a busy day when stock had just been received.

Barber Bros.' Busy Plumbing Establishment at Vancouver, B. C.

The members of the firm, as shown from left to right, are: Benjamin Barber, R. Barber and H. A. Barber. This firm has been in business for only two years, but is "making good" and have at the present time a number of large contracts in hand, among them being work on the Catholic Church.

The other view introduces to our readers the shop of W. A. Brown, who takes pride in the fact that he is a plumber and puts it on his window in just as big letters



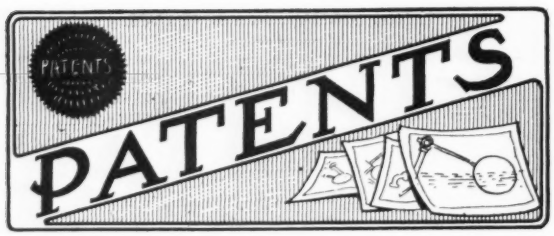
W. A. Browns' Attractive Plumbing Establishment at Vancouver, B. C.

as if it were "M. D." We are glad to see that he backs up his announcement by a window which shows such an attractive display of plumbing goods. Mr. Brown has been in business for 13 years (13 is a lucky number for some people, evidently) and he has a number of large contracts at the present time.

Lindsay, Cal.—J. D. Evenger has disposed of his plumbing business to H. Brisco.

Oakland, Cal.—V. Pozzi, plumber, was accidentally shot recently while cleaning a rifle, the bullet passing through his foot.

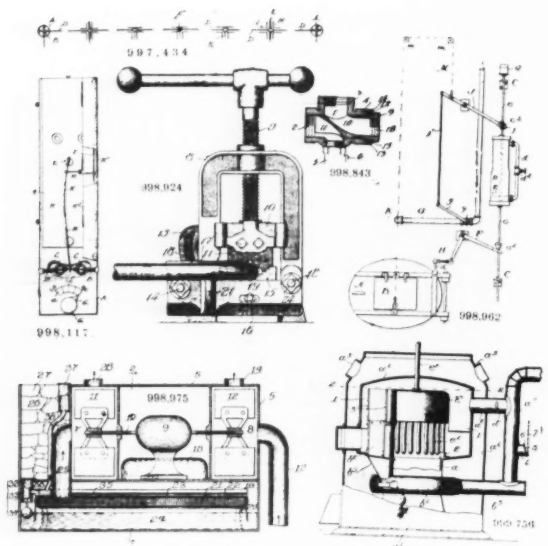
Dillon, Mont.— The business of the Dillon Plumbing & Heating Co. has been taken over by the Dillon Implement Co. E. E. Marcoe, who was connected with the former concern is in charge and reports a number of large contracts in hand.



Heating Department.

997,434. Underground Steam Distributing System. Eugene L. Barnes, Detroit, Mich. The combination with a main conduit, of consecutive manholes for the opposite ends of said conduit, expansion joints in said manholes, an anchor in said conduit intermediate said consecutive manholes, a series of service pipes distributed along the main conduit intermediate the anchored point and said consecutive manholes, and connections between said service pipes and the main conduit providing for the differential movement of the latter in expansion and contraction.

998,117. Temperature-Regulator. Albert N. Ozias, Minneapolis, Minn. In a thermostatic temperature regulator, the combination with a control arm adapted to be moved by changes in temperature, of thermostat members embodying a supporting plate having a projection along one edge and formed of material having a high coefficient of expansion, a flexible member having a low coefficient of expansion with its ends anchored to said projection and a connection between the center of said flexible member and control arm, the flexible member being maintained under pressure tending to deflect the same transversely.



998,843. T Pipe and Plug for Heating Systems. John Dunn, Winnipeg, Manitoba, Canada. The combination comprising a tee pipe provided with three arms having communicating openings therein, all of said openings being provided with interior threads, a drip pipe connected with a tee pipe, a removable and turnable plug within the tee pipe provided with a duct and a groove, said duct connecting two of the openings in the pipe, and the said groove connecting the opening in the remaining pipe with the drip pipe and means for securing the plug in position, as and for the purpose specified.

988,924. Elbow-Former Attachment for Pipe-Vises. Ira D. Powell, Forest Park, Ill. In combination with a vise, a supplemental plate attached thereto and having formed integrally therewith a former block adjacent the jaws of the vise and adjustable in line with the opening of said jaws, whereby a pipe may be grasped by the vise jaws and shaped about the former, as set forth.

998,962. Smoke-Preventing Device. Joseph P. Doyle, Cleveland, O. In a smoke-preventing device, the combination of a furnace door hinged at one side on a vertical axis and having an opening through it, a movable damper covering said opening and hinged along its top edge to said door on a horizontal axis, a steam-pipe entering the furnace and having a jet-discharging head therein, the valve in said steam-pipe having an external operating arm, a dash-pot cylinder containing a fluid, a piston movable therein and having rods connected therewith projecting through both ends of said cylinder, a pivoted lever having an operative connection with one of said rods, a link connecting said lever with the operating arm of the steam valve, a cord connecting said lever with the damper, guide sheaves over which said cord extends, and mechanism intermediate the furnace door and the lower projecting piston rod whereby the latter is moved upward when the furnace door is opened.

998,975. Heating, Cooling, and Ventilating System. Frank P. Mies, Chicago, Ill., assignor to The Plural System Ventilator Co. In a device of the character described, a casing containing a fan-chamber, and a motor-chamber, and a separate water-chamber, the latter provided with an air-intake arranged to direct the incoming air directly upon the surface of the water in said water-chamber, and an elongated conduit made of reticulated water-holding material, and otherwise closed, supported above the water-level in said water-chamber, and an imperforate conduit connecting said perforate conduit with the intake opening of said fan-casing whereby the incoming air is cleansed and humidified.

999,756. Combined Steam and Hot-Air Heater. John Demarest, Springfield, Mass. In a heater having a heating-dome and a water-boiler centrally located therein, and a fire-pot beneath said boiler, an upright separator interposed between the dome and boiler at the top and opposite sides thereof and extending downward toward the fire-pot, to effect a substantially equal separation of the products of combustion at opposite sides of the separator, a direct outlet for such products, communicating with the dome at each side of the separator, and indirect outlets for the products of combustion, communicating with the dome near its top and at opposite sides of the separator.

Plumbing Department.

998,126. Faucet. Henry H. Sherk, Pasadena, Cal., assignor to James B. Clow & Sons, Chicago, Ill. A faucet made of hard, refractory material and having a spout, proper, a shield of bell-shape, and a nozzle located within the shield and extending downward from the top portion or dome thereof, and terminating above the bottom thereof, said shield and nozzle being impervious to water.

998,181. Water-Heater. John B. Jones, Philadelphia, Pa. In a water-heater, the combination with a shell or casing, having openings therein to induce a current of hot air through said shell or casing, a burner located in the central portion of the bottom of the casing, and a pipe coil located within the shell or casing having vertical runs of pipe, certain of said vertical runs congregated together at the center of the casing and located directly above the burner, a water tank supported and secured on the upper edge of the shell or casing and covering the entire upper end of the shell or casing, the outlet end of said coil communicating with the bottom of said tank, and an outlet pipe connected to the top of said tank for conveying the hot water to its place of use, substantially as described.

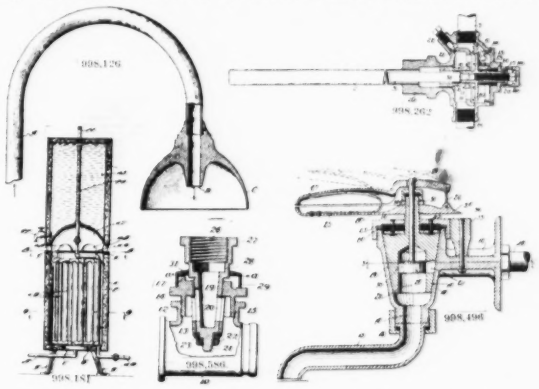
998,262. Thermostatic Valve. Frederick W. Robertshaw, Pittsburgh, Pa. In a thermostatic valve, a thermostatic element, and a valve arranged to be acted upon by said element to unseat the valve, said valve having an adjustable stem projecting exteriorly of the casing, the inner end of said stem forming the point of contact with the thermostatic element, and the outer end of the stem having a wrench or key seat; substantially as described.

998,496. Faucet. Edward Goldeskie, Sunbury, Pa., assignor of one-fourth to Jefferson E. Shipman, Sunbury, Pa. In a faucet, the combination of a casing provided with a pair of intake ports and a discharge port, a plug rotably mounted in said casing and having a recess in

its lower end in communication with the discharge port and also having a transverse aperture opening through the wall of said recess intermediate the ends of the latter adapted to be moved into separate or collective communication with the intake ports when the plug is rotated; a handle for rotating said plug and including a pivoted section, a plunger slidably mounted in said recess adapted to uncover and cover said aperture, connections between said plunger and the pivoted section of the handle whereby the movement of the latter will slide said plunger, and a spring constantly tending to move the pivoted section of the handle to shift the plunger so as to uncover said transverse aperture.

998,586. Combined Hydrant and Stop and Waste Cock. Philip Mueller and Henry Mueller, Decatur, Ill.; Ora B. Mueller and Adolph Mueller, executors of said Henry Mueller, deceased, assignors to H. Mueller Manufacturing Co., Decatur, Ill., a corporation of Illinois. The combination with a water main of a casing having a wrench cap at one end and a main body portion at the other, a downwardly extending flange beneath said cap, said main body portion spaced from said flange and having a free end within said main, said flange removably engaging said main to rigidly support said casing, a plug seated within said casing and having an exterior and interior abutment for a turning tool, a cap removably and rotatingly carried by said plug and engaging the wrench cap of said casing, said casing and plug formed with registering inlet ports beneath said wrench cap, a waste chamber carried by the latter having communication with one of said inlet ports, a stop lug carried by said removable cap and diametrically opposite stop lugs formed on said wrench cap to engage therewith.

998,282. Faucet. Charles W. Donholt, Ridgewood, N. J. A faucet comprising a casing having inlet and outlet ports, said casing being formed with an interiorly threaded extension and having a concaved lip at the lower end of the threaded portion, a partition wall formed with the casing and extension the upper portion of which extends downwardly from the wall of the casing in alinement with the rear portion of the extension at the inlet side and provided with an inwardly directed lower end, and the lower portion of which extends upwardly, from the bottom of the casing and formed with an outwardly flared upper portion in alinement with the front portion of the extension at the outlet side and coacting with said inwardly directed lower end to form a conical valve seat, a cap closing the upper end of the extension and an operating stem having an integral screw threaded head working in the extension, said head having a concaved under surface tapering to form the valve stem proper and coacting with said concaved lip and a conical head at the lower



end of the valve stem integral therewith adapted to coact with the conical valve seat.

998,585. Drinking-Fountain. Henry J. Milner, Chicopee, Mass., assignor of one-third to Thomas A. MacDonald and one-third to Morris J. Leahy, Chicopee, Mass. In a drinking-fountain, in combination an axially horizontal valve casing having a water inlet thereinto, a valve for closing the flow of water into said casing, a tubular arm having an upwardly directed mouthpiece and provided with an angular tubular limb vertically journaled in the valve casing, such tubular arm normally having a position beneath the valve casing, and adapted to be swung in a horizontal plane from thereunder, and means between the said vertical limb and the valve for operating the latter.

THE CAPITOL RADIATOR TRUCK

"United States Radiator Corporation,
Detroit, Mich.
Gentlemen:—Replying to your inquiry of the first inst., regarding the Capitol radiator truck which we purchased from you about three years ago, beg to say that it has proved entirely satisfactory and we would not be without it for many times its cost. Yours very truly,
R. J. Mercer & Co.,
Heating Engineers,
Traverse City, Mich."

What One Man Can Do With It.

Handle alone the heaviest radiator.

Set it in any nook or corner.

Wheel it through the narrowest doorway.

Deposit it right at valve ready for connection.

Roll it on polished floors without marring them.

Do all this quickly and without great effort.

The Capitol Radiator Truck

is the most practical time saving device on the market today for heating contractors. It sells at a very reasonable price and its cost will be saved in the first job or two.

Once purchased it becomes an absolute necessity. Every contractor should have one.

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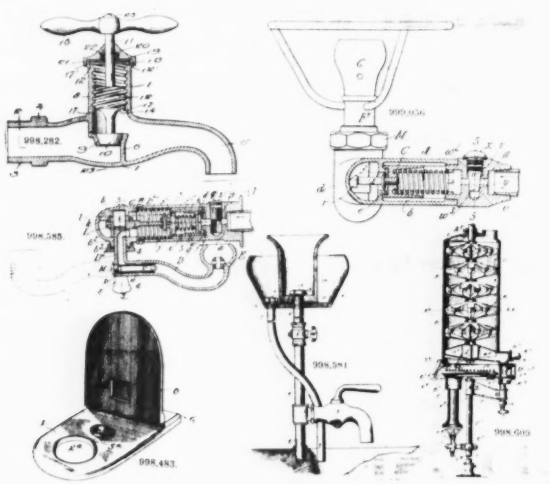
Kindly quote "Domestic Engineering" in writing advertisers.

998,483. Closet-Seat. Joseph G. Ellis, Denison, Tex. A closet-seat having a large front opening to permit the passage of urine and a small rear opening to permit the passage of feces, the said openings being out of communication with each other and arranged in the same general plane, the part of the seat immediately surrounding the small rear opening being adapted to embrace the rectum and to exert an upward pressure there against.

999,056. Sanitary Drinking-Fountain. Charles R. Price, Chicopee, Mass. In a sanitary drinking fountain, in combination an axially horizontal valve casing having a water inlet passage and provided with an upwardly extending partially rotative member provided with a mouthpiece, a valve in said casing, and means operated by the rotative member for opening the valve and the water inlet portion of the casing having a transverse socket intersecting the water passage therethrough open at its one end only and of increased diameter, and screw threaded adjacent the mouth thereof, and a plug having portions of different diameters fitting in said socket, having a transverse opening therethrough and having its portion of larger diameter threaded, sunk and screw engaged within the correspondingly threaded wall of said socket.

998,581. Drinking-Fountain. John Edward Johnsen, Chicago, Ill. The combination with a stationary wash-bowl, of a cold-water-pipe and faucet leading thereto; an upwardly extending branch pipe connected with said cold-water pipe; a valve in said branch pipe; a drain bowl threaded to the upper end of said branch pipe; a drain-pipe threaded in the bottom of and leading from said drain bowl to said wash bowl; a nut threaded on the end of said drain pipe within said drain bowl; a gasket interposed between said nut and the bottom of said drain bowl; a drinking cup threaded to the upped end of said branch pipe within and extending well above said drain bowl; a drinking cup threaded to the upper end of said cup and drain bowl; a nut on the upper end of said branch pipe within said cup; and a gasket interposed between said nut and the bottom of said cup, substantially as described.

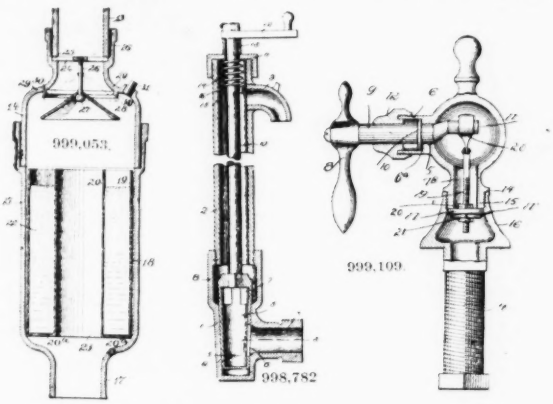
998,609. Water-Heater. Bernard A. Guerink, East Cleveland, Ohio, assignor to The Trenkamp Stove & Manufacturing Co., Cleveland, O., a corporation of Ohio. A water-heater comprising a suitable support, a water-container mounted thereon, a casing for said container, a



vertically disposed fuel supply-pipe fixed with respect to said support, and a burner adapted to removably rest upon said support, said burner including a mixing chamber formed to present a handle and adapted, when thus resting on said support, to loosely engage said supply-pipe.

999,053. Fitting for Vents of Sewers. John J. Mitchell, Harrison, N. J. A fitting for vents comprising an upper and a lower member, each of the members having an opening in its outer end, a receptacle in the lower member, the receptacle having a passage through it and having an annular chamber, a bolt, means for suspending the bolt in the upper member, a head on the lower end of the bolt, and a valve sliding on the bolt and adapted to be normally suspended on the head of the bolt, the upper member having a valve-seat therein against which the valve is adapted to be forced by a reverse current.

998,782. Hydrant. Frank T. Lake, Philadelphia, Pa. In a hydrant, the combination with a boxing having a conical valve case, and an enlarged chamber in its upper



portion, of a hollow conical valve in said casing, having an inlet to register with the inlet of the boxing, and an annular series of openings in its upper portion communicating with the chamber, a barrel screwed into the upper end of said chamber, a spout on said barrel, a rod projecting up through the barrel and secured to the valve, and means for holding said valve in its lowered position, substantially as described.

999,109. Faucet. Roy Howell, Kingston, Pa. A faucet comprising a casing, a valve chamber having a decreasing diameter toward the axial line of the casing, the said casing having a valve seat at the small end of the chamber, a stem movable through the casing and extending into the chamber, a valve adjustably mounted on the stem and normally held under the pressure of the water against the seat of the casing, a valve controlling member movably supported by the casing, means movably connecting the valve stem with the valve controlling member, a shoulder formed on the casing, and a member formed on the valve controlling means and bearing against the shoulder of the casing to hold the valve stem connecting means in axial alinement with the valve stem.

To Be a Man.

If you can keep you head when all about you
Are losing theirs and blaming it on you;
If you can trust yourself when all men doubt you,
But make allowance for their doubting too;

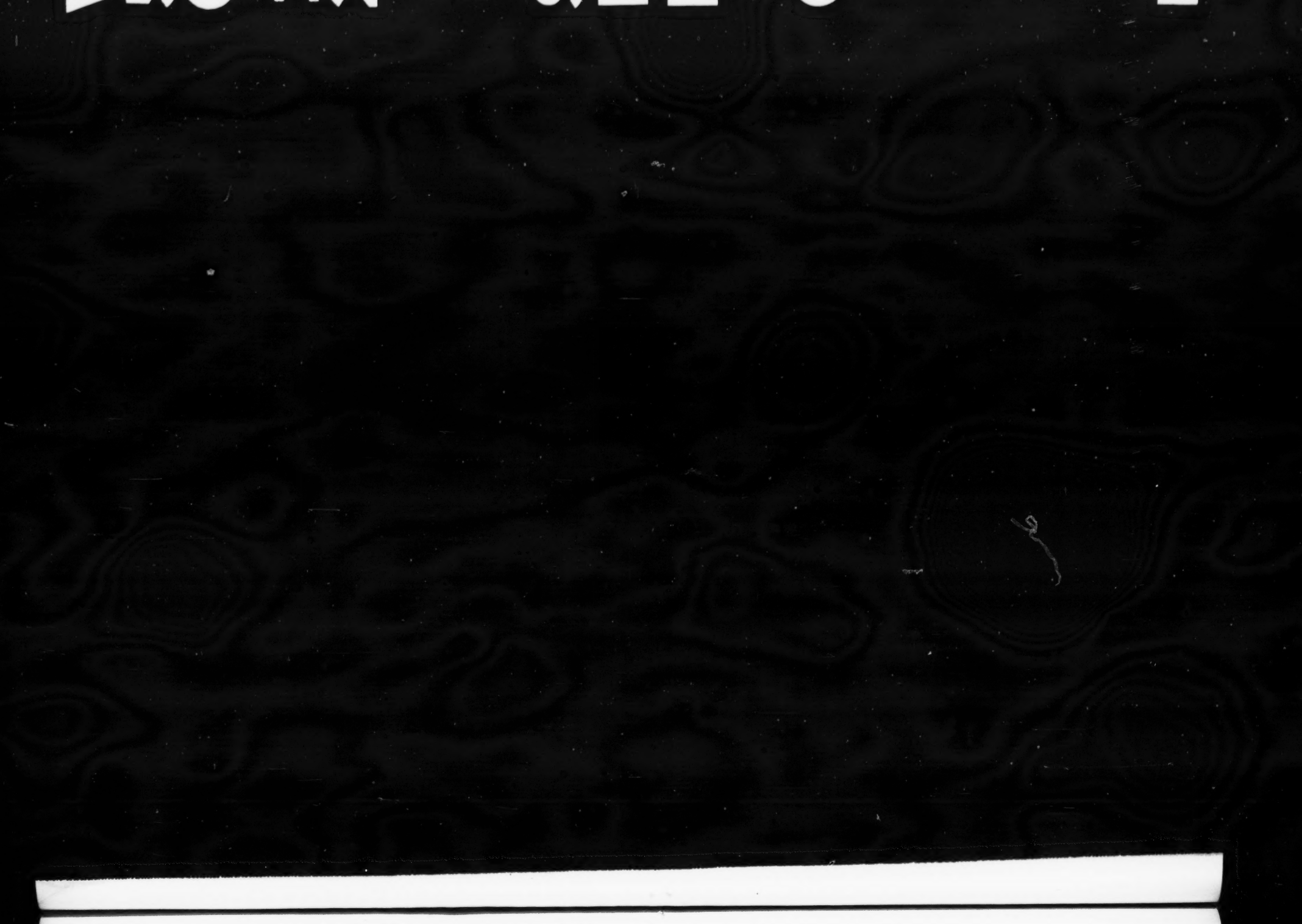
If you can wait and not be tired by waiting
Or being lied about don't deal in lies,
Or being hated don't give way to hating,
And yet don't look too good, nor talk too wise;

If you can dream—and not make dreams your master;
If you can think—and not made thoughts your aim;
If you can meet with Triumph and Disaster
And treat those two imposters just the same;

* * *

If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the will which says to them: "Hold on;"

* * *

If you can fill the unforgiving minute
With sixty seconds worth of distance run,
Yours is the Earth and everything that's in it,
And—which is more—you'll be a Man, my son.

—Rudyard Kipling.